CORNELL UNIVERSITY

NEW YORK STATE COLLEGE OF AGRICULTURE

1944-45

PUBLISHED BY THE UNIVERSITY
ITHACA, NEW YORK

The Calendar, 1944-45

The College of Agriculture will offer two terms of sixteen weeks each during the academic year 1944–45, beginning on October 31 and March 2 respectively. In order that agricultural students may be available for farm work, the College of Agriculture will not hold a regular term during the months from June through October; other divisions of the University will be in session during this period. The Calendar of the College of Agriculture is as follows:

1944			FALL TERM
Nov.	1,	*Wednesday,*	Registration, civilian students.
Nov.	2,	*Thursday,*	Registration, Navy students.
Nov.	3,	*Friday,*	Instruction begins at 8 A.M.
Nov.	23,	*Thursday,*	Last day for the payment of tuition for the Fall Term.
Dec.	25,	*Monday,*	Christmas, a holiday.
1945			
Feb.	22,	*Thursday,*	Instruction ends at 4 P.M.
			SPRING TERM
March	2,	*Friday,*	Registration, Navy students.
March	3,	*Saturday,*	Registration, civilian students.
March	5,	*Monday,*	Instruction begins at 8 A.M.
March	29,	*Thursday,*	Last day for the payment of tuition for the Spring Term.
June	23,	*Saturday,*	Instruction ends at 12:50 P.M.

CORNELL UNIVERSITY OFFICIAL PUBLICATION

PUBLISHED BY CORNELL UNIVERSITY AT ITHACA, N. Y.

Monthly in September, October, and November
Semi-monthly, December to August inclusive

Volume 35 May 1, 1944 Number 18

[*Entered as second-class matter, December 14, 1916 at the post office at Ithaca, New York, under the act of August 24, 1912*]

NEW YORK STATE COLLEGE OF AGRICULTURE

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William Irving Myers, Ph.D., Dean of the College of Agriculture, Professor of Farm Finance, and Agricultural Economist in the Experiment Station.
Anson Wright Gibson, M.S., Director of Resident Instruction and Professor in Personnel Administration.
Lloyd R. Simons, B.S., Director of Extension and Professor in Extension Service.
Carl Edward Frederick Guterman, Ph.D., Director of Research, Director of the Cornell University Agricultural Experiment Station, and Professor of Plant Pathology.
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John Parker Hertel, Ph.D., Associate Professor in Personnel Administration and Secretary of the College.
Howard Styring Tyler, Ph.D., Associate Professor in Personnel Administration in charge of Vocational Guidance and Placement.
Willard Waldo Ellis, A.B., LL.B., Librarian.
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Arthur Howard Peterson, M.A., Bursar.

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Liberty Hyde Bailey, M.S., LL.D., Litt.D., Ex-Dean, Professor Emeritus, and Director of Hortorium.
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James Adrian Bizzell, Ph.D., Professor of Soil Technology, Emeritus.
Theodore Hildreth Eaton, Ph.D., Professor of Rural Education, Emeritus.
Rollins Adams Emerson, Ph.D., Professor of Plant Breeding, Emeritus.
George Abram Everett, A.B., LL.B., Professor of Extension Teaching, Emeritus.
Glenn Washington Herrick, B.S.A., Professor of Economic Entomology, Emeritus.
Ralph Sheldon Hosmer, B.S.A., M.F., Professor of Forestry, Emeritus.
Oskar Augustus Johannsen, Ph.D., Professor of Entomology, Emeritus.
George Nieman Lauman, B.S.A., Professor of Rural Economy, Emeritus.
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Flora Rose, B.S., M.A., D.Ped., D.Sc., Professor of Home Economics, Emeritus.
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Hugh Charles Troy, B.S.A., Professor of Dairy Industry, Emeritus.
William Joseph Wright, M.S., Professor in Extension Service, Emeritus.

Howard Bernhardt Adelmann, Ph.D., Professor of Histology and Embryology.
William Henry Adolph, Ph.D., Acting Professor of Nutrition and Biochemistry and Nutritionist in the Experiment Station.

Arthur Augustus Allen, Ph.D., Professor of Ornithology and Ornithologist in the Experiment Station.*
Walfred Albin Anderson, Ph.D., Professor of Rural Sociology and Rural Sociologist in the Experiment Station.
Sydney Arthur Asdell, Ph.D., Professor of Animal Physiology and Animal Physiologist in the Experiment Station.
Mortier Franklin Barrus, Ph.D., Extension Professor of Plant Pathology.
Cora Ella Binzel, M.A., Professor of Rural Education.
Sarah Gibson Blanding, M.A., Dean of the College of Home Economics.
Forest Milo Blodgett, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Maurice Chester Bond, Ph.D., Extension Professor of Marketing.
Harold Eugene Botsford, B.S., Extension Professor of Poultry Husbandry.*
Richard Bradfield, Ph.D., D.Sc., Professor of Soil Technology and Soil Technologist in the Experiment Station.
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Stanley J. Brownell, M.A., M.S., Extension Professor of Animal Husbandry.
Jacob Herbert Bruckner, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
Herman Jacob Brueckner, Ph.D., Extension Professor of Dairy Industry.*
Harry Oliver Buckman, Ph.D., Professor of Soil Technology.
Walter H. Burkholder, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Arthur Brotherton Burrell, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Frank Pores Bussell, Ph.D., Professor of Plant Breeding.
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Joshua Alban Cope, M.F., Extension Professor of Forestry.
Leonard Slater Cottrell, jr., Ph.D., Professor of Sociology and Rural Sociologist in the Experiment Station.*
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Lowell Clem Cunningham, Ph.D., Extension Professor of Farm Management.
Otis Freeman Curtis, Ph.D., Professor of Botany and Plant Physiologist in the Experiment Station.
Ralph Wright Curtis, M.S.A., Professor of Ornamental Horticulture.
Arthur Chester Dahlberg, Ph.D., Professor of Dairy Industry and Dairy Technologist in the Experiment Station.
Dorothy Celia DeLany, M.S., Professor in Extension Service and Assistant State 4-H Club Leader.
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Lynn Arthur Emerson, E.E., Ph.D., Professor of Industrial Education.
Emery N. Ferriss, Ph.D., Professor of Rural Education.
Harry Morton Fitzpatrick, Ph.D., Professor of Plant Pathology and Mycologist in the Experiment Station.
Richard Felix Fricke, B.S., Professor in Extension Service and Assistant State Leader of County Agricultural Agents.
Alpheus Mansfield Goodman, B.S.A., Extension Professor of Agricultural Engineering.
Cedric Hay Guise, B.S., M.F., Professor of Forestry.
Axel Ferdinand Gustafson, Ph.D., Professor of Soil Technology and Soil Technologist in the Experiment Station.
Edward Sewall Guthrie, Ph.D., Professor of Dairy Industry and Dairy Technologist in the Experiment Station.

*On leave fall term.

Goldan Orlando Hall, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
Earle Volcart Hardenburg, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Floyd Arthur Harper, Ph.D., Professor of Marketing and Investigator in Marketing in the Experiment Station.
Van Breed Hart, Ph.D., Extension Professor of Farm Management.
Herbert Bertsch Hartwig, Ph.D., Professor of Field Crops.
Frederick Emil Heinzelman, B.S., Professor in Extension Service and Assistant State 4-H Club Leader.
Mary Francis Henry, M.A., Assistant Dean of the College of Home Economics and Professor of Home Economics.
Barbour Lawson Herrington, Ph.D., Professor of Dairy Chemistry and Chemist in the Experiment Station.
Gustave Frederick Heuser, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
Frank Forrest Hill, Ph.D., Professor of Land Economics and Land Economist in the Experiment Station.
Albert Hoefer, B.S., Professor in Extension Service and State 4-H Club Leader.
Melvin Butler Hoffman, Ph.D., Extension Professor of Pomology.
Frank Bonar Howe, M.S., Professor of Soil Technology and Soil Surveyor in the Experiment Station.
Harley Earl Howe, Ph.D., Professor of Physics.
Frederick Bruce Hutt, Ph.D., D.Sc., Professor of Animal Genetics and Animal Geneticist in the Experiment Station.
Burton Aaron Jennings, B.S., Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station.
Lincoln David Kelsey, B.S., Professor in Extension Service.‡
Myron Slade Kendrick, Ph.D., Professor of Public Finance.
Asa Carlton King, B.S.A., Professor of Farm Practice and Farm Superintendence.
George Abdallah Knaysi, Ph.D., Professor of Bacteriology and Bacteriologist in the Experiment Station.
Lewis Knudson, Ph.D., Professor of Botany and Plant Physiologist in the Experiment Station.
Paul J. Kruse, Ph.D., Professor of Rural Education.
Albert Washington Laubengayer, Ph.D., Professor of Chemistry.
Harry Houser Love, Ph.D., Professor of Plant Breeding and Plant Breeder in the Experiment Station.
Clive Maine McCay, Ph.D., Professor of Nutrition and Nutritionist in the Experiment Station. (In Military Service.)
John Clarence McCurdy, B.S., C.E., Professor of Agricultural Engineering.
Laurence Howland MacDaniels, Ph.D., Professor of Horticulture and Horticulturist in the Experiment Station.*
Louis Melville Massey, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Robert Matheson, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.
Leonard Amby Maynard, Ph.D., Professor of Nutrition and Nutritionist in the Experiment Station.
Howard Bagnall Meek, Ph.D., Professor of Hotel Administration.
John Ivan Miller, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
Edward Gardner Misner, Ph.D., Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Clyde B. Moore, Ph.D., Professor of Rural Education.
Richard Alan Mordoff, Ph.D., Professor of Meteorology.

*On leave fall term.
‡On leave fall and spring terms.

Fred Bishop Morris, B.S., Professor in Extension Service and State Leader of County Agricultural Agents.
Frank Barron Morrison, B.S., Professor of Animal Husbandry and Animal Nutrition and Animal Husbandman and Animal Nutritionist in the Experiment Station.
Walter Conrad Muenscher, Ph.D., Professor of Botany and Weed Specialist in the Experiment Station.
Philip Alexander Munz, Ph.D., Professor of Botany and Horticulture in the Bailey Hortorium.
Charles Merrick Nevin, Ph.D., Professor of Geology.
Allan Goodrich Newhall, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Leo Chandler Norris, Ph.D., Professor of Nutrition and Nutritionist in the Experiment Station.
Charles Edmund Palm, Ph.D., Professor of Entomology and Entomologist in the Experiment Station.
E. Laurence Palmer, Ph.D., Professor of Rural Education.
George Eric Peabody, M.S., Professor of Extension Teaching.
Frank Ashmore Pearson, Ph.D., Professor of Prices and Statistics and Statistician in the Experiment Station.
Loren Clifford Petry, Ph.D., Professor of Botany.
Everett Franklin Phillips, Ph.D., D.Sc., Professor of Apiculture and Apiculturist in the Experiment Station.
Whiton Powell, Ph.D., Professor of Business Management and Investigator in Business Management in the Experiment Station.
Otto Rahn, Ph.D., Professor of Bacteriology and Bacteriologist in the Experiment Station.
George Joseph Raleigh, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Frank Harrison Randolph, B.A., M.E., Professor of Institutional Engineering.
Lowell Fitz Randolph, Ph.D., Professor of Botany and Cytologist in the Experiment Station.
Marius Peter Rasmussen, Ph.D., Professor of Marketing and Investigator in Marketing in the Experiment Station.
Philip Adna Readio, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.
Donald Reddick, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.*
Howard Wait Riley, M.E., Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station.
Byron Burnett Robb, M.S., in Agr., Professor of Agricultural Engineering.
Montgomery E. Robinson, Litt.B., B.S., Professor in Extension Service.
Louis Michael Roehl, B.S., Professor of Farm Mechanics.*
Harold Ellis Ross, M.S.A., Professor of Dairy Industry.
Glenn Wade Salisbury, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
Gad Parker Scoville, B.S. in Agr., M.A., Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Lester Whyland Sharp, Ph.D., D.Sc., Professor of Botany and Cytologist in the Experiment Station.
Paul Francis Sharp, Ph.D., Professor of Dairy Chemistry and Chemist in the Experiment Station.
James Morgan Sherman, Ph.D., Professor of Dairy Industry and Bacteriologist in the Experiment Station.
Ora Smith, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Leland Spencer, Ph.D., Professor of Marketing and Investigator in Marketing in the Experiment Station.

*On leave fall term.

Clifford Nicks Stark, Ph.D., Professor of Bacteriology and Bacteriologist in the Experiment Station.
Rolland Maclaren Stewart, Ph.D., Professor of Rural Education.
James Batcheller Sumner, Ph.D., Professor of Biochemistry.
Charles Arthur Taylor, B.S., Professor in Extension Service.
Homer Columbus Thompson, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Flora Martha Thurston, M.S., Professor of Home Economics Education.
Kenneth Leroy Turk, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
Ernest Van Alstine, Ph.D., Extension Professor of Soil Technology.
Stanley Whitson Warren, Ph.D., Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Donald Stuart Welch, Ph.D., Professor of Plant Pathology and Forest Pathologist in the Experiment Station.
Philip Henry Wessels, M.S., Research Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Herbert Hice Whetzel, M.A., D.Sc., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Roy Glenn Wiggans, Ph.D., Professor of Plant Breeding and Plant Breeder in the Experiment Station.
John Peter Willman, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
James Kenneth Wilson, Ph.D., Professor of Soil Technology and Soil Bacteriologist in the Experiment Station.
Andrew Leon Winsor, Ph.D., Professor of Rural Education.
Paul Work, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Edmund Louis Worthen, M.S.A., Extension Professor of Soil Technology.
Albert Hazen Wright, Ph.D., Professor of Zoology and Curator of Vertebrates.

Associate Professors

LeRoy Lesher Barnes, Ph.D., Associate Professor of Biophysics.‡
Damon Boynton, Ph.D., Associate Professor of Pomology and Associate Pomologist in the Experiment Station.
George Samuel Butts, B.S., Associate Professor in Extension Service and Supervisor of Farm Study Courses.
Robert Flint Chandler, jr., Ph.D., Charles Lathrop Pack Associate Professor of Forest Soils.
Daniel Grover Clark, Ph.D., Associate Professor of Botany and Associate Botanist in the Experiment Station.
Robert Theodore Clausen, Ph.D., Associate Professor of Botany and Associate Botanist in the Experiment Station.
William Marshall Curtiss, Ph.D., Associate Professor of Marketing and Investigator in Marketing in the Experiment Station.
Arthur Watson Dimock, Ph.D., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station.
Irwin Clyde Gunsalus, Ph.D., Associate Professor of Bacteriology and Associate Bacteriologist in the Experiment Station.
William John Hamilton, jr., Ph.D., Associate Professor of Zoology and Associate Zoologist in the Experiment Station. (In Military Service.)
David Birney Hand, Ph.D., Associate Professor of Biochemistry and Associate Chemist in the Experiment Station.*
Daniel Leo Hayes, B.S., Associate Professor in Extension Service and Assistant State Leader of County Agricultural Agents.
Charles Seright Hobbs, Ph.D., Extension Associate Professor of Animal Husbandry.

*On leave fall term.
‡On leave fall and spring terms.

Joseph Douglas Hood, Ph.D., Associate Professor of Biology and Associate Biologist in the Experiment Station.
Edwin Raymond Hoskins, Ph.D., Associate Professor of Rural Education.
Margaret Hutchins, Ph.D., Associate Professor of Rural Education.
Rowland Willis Leiby, Ph.D., Extension Associate Professor of Entomology.
Josiah Randall Livermore, Ph.D., Associate Professor of Plant Breeding and Associate Plant Breeder in the Experiment Station.
John Kaspar Loosli, Ph.D., Associate Professor of Animal Nutrition and Associate Animal Nutritionist in the Experiment Station.
Wilfred Douglas Mills, Ph.D., Extension Associate Professor of Plant Pathology.
Charles McCammon Mottley, Ph.D., Associate Professor of Limnology and Fisheries and Fish Culturist in the Experiment Station. (In Military Service.)
Henry Martin Munger, Ph.D., Associate Professor of Plant Breeding and Vegetable Crops and Associate Plant Breeder in the Experiment Station.
Roy A. Olney, Ph.D., Associate Professor of Rural Education.
Michael Peech, Ph.D., Associate Professor of Soil Science and Soil Chemist in the Experiment Station.
Elmer Strobel Phillips, B.S., Associate Professor in Extension Service.
Hans Platenius, Ph.D., Associate Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Robert Arnold Polson, Ph.D., Extension Associate Professor of Rural Sociology.
Joseph Pullman Porter, B.S., M.S.A., M.L.D., Associate Professor of Ornamental Horticulture.
Kenneth Post, Ph.D., Associate Professor of Floriculture and Associate Floriculturist in the Experiment Station.
Arthur John Pratt, Ph.D., Extension Associate Professor of Vegetable Crops.
Clinton Beaumont Raymond, B.S., Extension Associate Professor of Vegetable Crops.
Alexis Lawrence Romanoff, Ph.D., Associate Professor of Poultry Husbandry and Associate Poultry Husbandman in the Experiment Station.
Charles Inglehart Sayles, B.S., M.E.E., Associate Professor of Institutional Engineering.*
Herbert Henry Schwardt, Ph.D., Associate Professor of Entomology and Associate Entomologist in the Experiment Station.
George Henry Serviss, M.S.A., Extension Associate Professor of Field Crops.
Sanford Reuben Shapley, B.S., Associate Professor in Extension Service and Assistant State Leader of County Agricultural Agents.
Earl Young Smith, B.S., Extension Associate Professor of Poultry Husbandry.
William Arthur Smith, Ph.D., Associate Professor of Rural Education.
Robert Mumford Smock, Ph.D., Associate Professor of Pomology and Associate Pomologist in the Experiment Station.
Edward Andrews Tenney, Ph.D., Associate Professor of English.
Leon John Tyler, Ph.D., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station.
Wayne William Umbreit, Ph.D., Acting Associate Professor of Bacteriology. (July to September.)
Harold Anthony Willman, M.S., Extension Associate Professor of Animal Husbandry.
Forrest Blythe Wright, Ph.D., Associate Professor of Agricultural Engineering.

Assistant Professors

Raymond Albrectsen, M.S., Extension Assistant Professor of Animal Husbandry.
Samuel R. Aldrich, Ph.D., Extension Assistant Professor of Agronomy.
Raymond Clayton Allen, Ph.D., Assistant Professor of Floriculture.*
Sanford Soverhill Atwood, Ph.D., Assistant Professor of Plant Breeding and Assistant Geneticist in the Experiment Station.

*On leave fall term.

Winfred Enos Ayres, Assistant Professor of Dairy Industry.
Erl Bates, M.D., M.S., Adviser in Indian Extension.
Thomas Levingston Bayne, jr., Ph.D., Assistant Professor of Rural Education.
Ivan Rae Bierly, Ph.D., Extension Assistant Professor of Marketing.
William Ernest Blauvelt, Ph.D., Extension Assistant Professor of Economic Entomology.
Clarence Greenfield Bradt, B.S., Extension Assistant Professor of Animal Husbandry.*
Donald John Bushey, B.S., M.L.D., Extension Assistant Professor of Ornamental Horticulture.
Marlin George Cline, Ph.D., Assistant Professor of Soil Science and Assistant Soil Scientist in the Experiment Station.
Randall Knight Cole, Ph.D., Assistant Professor of Poultry Husbandry and Animal Genetics and Assistant Animal Geneticist in the Experiment Station. (In Military Service.)
Robert Leavitt Cushing, M.Sc., Assistant Professor of Plant Breeding.
Lawrence Bryce Darrah, Ph.D., Extension Assistant Professor of Farm Management.
Herrell Franklin DeGraff, Ph.D., Assistant Professor of Land Economics and Assistant Land Economist in the Experiment Station.
Mary Eva Duthie, Ph.D., Extension Assistant Professor of Rural Sociology.
Elton James Dyce, Ph.D., Extension Assistant Professor of Apiculture.
William Robert Eadie, Ph.D., Assistant Professor of Zoology and Assistant Zoologist in the Experiment Station. (In Military Service.)
Lewis Eldred, Ph.D., Assistant Professor of Education and Chairman of the Bureau of Educational Service.‡
Gordon Huff Ellis, Ph.D., Assistant Professor of Biochemistry and Nutrition.
David Baxter Fales, M.S.A., Assistant Professor in Extension Service and Assistant State 4-H Club Leader.
Karl Hermann Fernow, Ph.D., Extension Assistant Professor of Plant Pathology.
Delmar Simon Fink, Ph.D., Assistant Professor of Agronomy and Assistant Agronomist in the Experiment Station.
Clara Louise Garrett, B.S., Assistant Professor of Drawing.
Willis Alway Gortner, Ph.D., Assistant Professor of Biochemistry and Assistant Biochemist in the Experiment Station.
Iva Mae Gross, B.S., Assistant Professor in Extension Service and Assistant State 4-H Club Leader.
Frank Arling Haasis, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
Karl Clemens Hamner, Ph.D., Assistant Professor of Plant Physiology.
Paul Raymond Hoff, M.S.A., Extension Assistant Professor of Agricultural Engineering.
Louis Merwin Hurd, Extension Assistant Professor of Poultry Husbandry.
Thomas Norman Hurd, Ph.D., Extension Assistant Professor of Land Economics.*
Philip Gustav Johnson, Ph.D., Assistant Professor of Rural Education.
Denis Bowes Johnstone-Wallace, M.S., Assistant Professor of Agrostology and Agrostologist in the Experiment Station.
James Stephen Knapp, B.S., Assistant Professor in Extension Service.
Peter Paul Kellogg, Ph.D., Assistant Professor of Ornithology.*
Vladimir Nicitich Krukovsky, Ph.D., Assistant Professor of Dairy Industry and Assistant Dairy Technologist in the Experiment Station.
George H. M. Lawrence, Ph.D., Assistant Professor of Botany and Horticulture, Bailey Hortorium. (In Military Service.)
Benjamin George Leighton, B.S., Acting Extension Assistant Professor of Rural Sociology.

*On leave fall term.
‡On leave fall and spring terms.

Emmons William Leland, B.S.A., Experimentalist in Soil Technology and Assistant Field Experimentalist in the Experiment Station.
John Alfred Lennox, B.S., Assistant Professor in Extension Service and Assistant State 4-H Club Leader.
Harry Alexander MacDonald, Ph.D., Assistant Professor of Field Crops and Assistant Agronomist in the Experiment Station.
Robert Burns Musgrave, Ph.D., Assistant Professor of Field Crops and Assistant Agronomist in the Experiment Station.
Charles Franklin Niven, jr., Ph.D., Assistant Professor of Bacteriology and Assistant Bacteriologist in the Experiment Station.
Leland Bernard Norton, Ph.D., Assistant Professor of Insecticidal Chemistry (Geneva Station).
Robert Carroll Ogle, Extension Assistant Professor of Poultry Husbandry and Superintendent of Egg Laying Tests.
Kenneth Gardner Parker, Ph.D., Research Assistant Professor of Plant Pathology.
Alfred M. S. Pridham, Ph.D., Assistant Professor of Ornamental Horticulture and Assistant Ornamental Horticulturist in the Experiment Station.
Homer Seymour Pringle, B.S., Extension Assistant Professor of Agricultural Engineering.*
William Arthur Rawlins, Ph.D., Assistant Professor of Entomology and Assistant Entomologist in the Experiment Station.
Juan Estevan Reyna, E.E., M.A., Assistant Professor of Drawing.
Karl Leroy Smiley, Ph.D., Assistant Professor of Dairy Industry and Assistant Dairy Technologist in the Experiment Station.
Sedgwick Eugene Smith, Ph.D., Assistant Professor of Animal Physiology and Animal Physiologist in the Experiment Station.
Ernest Vernon Staker, Ph.D., Assistant Professor of Soil Technology and Assistant Soil Technologist in the Experiment Station.
Josephine Strode, Ph.B., M.A., Assistant Professor of Rural Sociology.
George Miksch Sutton, Ph.D., Assistant Professor of Ornithology and Curator of Birds. (In Military Service.)
Robert Dean Sweet, Ph.D., Extension Assistant Professor of Vegetable Crops.
Clesson Nathan Turner, B.S., Extension Assistant Professor of Agricultural Engineering.*
Ellis Flower Wallihan, Ph.D., Assistant Professor of Forestry and Silviculturist in the Experiment Station.*
Thomas Cobb Watkins, Ph.D., Assistant Professor of Economic Entomology and Assistant Entomologist in the Experiment Station.
Leland Eugene Weaver, B.S., Extension Assistant Professor of Poultry Husbandry.
Robert Henry White-Stevens, Ph.D., Assistant Professor of Vegetable Crops and Assistant Investigator in Vegetable Crops in the Experiment Station.
Hugh Monroe Wilson, Extension Soil Conservationist.

Instructors

Ethel Zoe Bailey, A.B., Curator, Bailey Hortorium.
Thomas Jefferson Baird, B.Arch., Instructor in Ornamental Horticulture.
Robert Francis Ball, M.S., Instructor in Poultry Husbandry and Animal Genetics and Assistant Animal Geneticist in the Experiment Station.
Winthrop Dexter Bellamy, B.S., Instructor in Dairy Industry.
H. Weston Blaser, Ph.D., Instructor in Botany and Assistant Botanist in the Experiment Station.
Graydon William Brandt, M.S., Extension Instructor in Animal Husbandry.
James David Burke, B.S., Extension Instructor in Animal Husbandry.
Ferdinand Hinckley Butt, Ph.D., Instructor in Entomology.

*On leave fall term.

Lowell William Charkey, M.S., Instructor in Poultry Nutrition.
Oliver Cecil Compton, M.S., Instructor in Pomology.
Leland Gwaltney Cox, Ph.D., Research Associate in Botany.
William Thomas Craig, Experimentalist in Plant Breeding in the Experiment Station.
Victor Macomber Cutter, jr., Ph.D., Instructor in Botany.
James Edwin Dewey, M.S., Extension Instructor in Entomology.
Henry Dietrich, Ph.D., Instructor in Entomology and Curator of Insects.
Roy Luther Donahue, Ph.D., Instructor in Agronomy.
Ernest Dorsey, Ph.D., Instructor in Plant Breeding and Assistant Plant Breeder in the Experiment Station.
Anna Louise Dunham, Ph.D., Instructor in Zoology.
Mrs. Emma Rose Elliott, B.S., Instructor in Rural Education.
Leah English, B.S., Analyst in Agronomy and Assistant in Chemical Analysis in the Experiment Station.
James Brainerd Evans, A.B., Instructor in Dairy Industry.
Donald Brice Ferguson, Ph.D., Extension Instructor in Marketing.
Walton Isaac Fisher, Experimentalist in Plant Breeding in the Experiment Station.
William Trowbridge Merrifield Forbes, Ph.D., Research Instructor in Entomology.
Ernest Sidney Ford, Ph.D., Instructor in Botany.
Eva Lucretia Gordon, M.S., Instructor in Rural Education.
William Theodore Grams, B.S.A., Instructor in Extension Service.‡
Cecil Robert Gross, M.S., Research Associate in Pomology.
Lorin E. Harris, Ph.D., Research Associate in Animal Nutrition.
Mabel Agnes Hastie, M.S.E., Instructor in Rural Education.
George Robert Johnson, B.S., Extension Instructor in Animal Husbandry.
Stewart McNeil Johnson, Ph.D., Extension Instructor in Marketing.
Merrill Newkirk Knapp, B.S., Instructor in Extension Teaching.*
Cloy D. Knodt, Ph.D., Instructor in Animal Husbandry.
Frank Vincent Kosikowsky, M.S.A., Instructor in Dairy Industry.
Richard August Laubengayer, Ph.D., Instructor in Botany.
John McCune Lawrence, Ph.D., Research Associate in Biochemistry.
John James McAllister, Experimentalist in Plant Breeding in the Experiment Station.
James McGinnis, Ph.D., Research Associate in Poultry Husbandry.
John Archibald Mack, M.S., Instructor in Rural Education.
John George Matthysse, Ph.D., Instructor in Entomology.
John Strong Niederhauser, Ph.D., Instructor in Plant Pathology.*
Charles Lawrence Norton, B.S., Instructor in Animal Husbandry.
Harold Jerome Palmer, A.B., Instructor in Rural Education and Acting Chairman of the Bureau of Educational Service.
Vernon Sennock Lee Pate, A.B., Instructor in Entomology.
Robert Lee Patton, Ph.D., Instructor in Insect Physiology.*
Lester Carl Peterson, Ph.D., Instructor in Plant Pathology.
William Mason Phipps, M.S.A., Analyst in Agronomy.
Emmett Idolia Robertson, M.S., Extension Instructor in Poultry Husbandry.
Cecil D. Schutt, Instructor in Animal Husbandry and Assistant in Animal Husbandry in the Experiment Station.
Milton Leonard Scott, A.B., Investigator in Nutrition.
Edwin Stanley Shepardson, B.S., Extension Instructor in Agricultural Engineering.
Gladys Athena Sperling, M.S., Research Instructor in Animal Nutrition.
William Davenport Swope, M.S., Extension Instructor in Plant Breeding.
George Walter Tailby, B.S.A., Extension Instructor in Animal Husbandry.
Joe Samuel Taylor, B.S., Extension Instructor in Animal Husbandry.

*On leave fall term.
‡On leave fall and spring terms.

John Fanning Thompson, Ph.D., Instructor in Biochemistry.
Allan Hosie Treman, A.B., LL.B., Lecturer in Business Law (fall term).
George W. Trimberger, M.S., Extension Instructor in Animal Husbandry.
Dwight Albert Webster, Ph.D., Instructor in Limnology and Fisheries.
James Carrick White, B.S., Instructor in Bacteriology.
Fred Everett Winch, jr., B.S., M.F., Extension Instructor in Forestry.
Asahel Davis Woodruff, Ph.D., Instructor in Rural Education.
Delmar J. Young, B.S., Extension Instructor in Animal Husbandry.

Assistants

Elfriede Abbe, B.F.A., Assistant in Botany.
Mrs. Mabel White Allen, B.A., Assistant in Botany.
Willis Harrison Ashton, Assistant in Agricultural Engineering.
Harold Hamilton Axtell, B.S., Assistant in Zoology.
Mrs. Annie Henriette Baumann, Assistant in Plant Pathology.
Kermit Molyneaux Bird, B.S., Assistant in Agricultural Economics.
Grant Etherington Blanch, M.S., Assistant in Marketing.
Helen Bozivich, M.S., Assistant in Poultry Husbandry.
Cecil Branton, B.S., Assistant in Animal Husbandry.
James Edward Briggs, M.S., Assistant in Animal Husbandry.
Babette Isabella Brown, M.A., Assistant in Botany.
Erwin Trowbridge Bullard, B.S., Research Assistant in Plant Breeding and Vegetable Crops.
Ernest Hastings Casseres, B.S., Research Assistant in Vegetable Crops.
Olaf Guido Cavetz, Ch.E., Assistant in Agronomy.
William Everett Chappell, M.S., Assistant in Vegetable Crops.
George Wilson Cochran, M.S., Assistant in Plant Pathology.
Evelyn Linda Cosby, B.S., Assistant in Biochemistry.
Lee Robert Crane, M.S. in Ed., Assistant in Agricultural Education.
Barbara Cross, B.A., Assistant in Botany.
Jeffery Earl Dawson, B.S.A., Research Assistant in Agronomy.
Jorge DeAlba, M.S.A., Assistant in Animal Physiology.
Richard Manley Dickerman, B.S., Assistant in Rural Education.
Mrs. Alice Stout Dietrich, A.B., Assistant in Entomology.
Desmond Daniel Dolan, M.S., Research Assistant in Vegetable Crops.
Otto Erickson, Assistant in Entomology.
William Hisayuki Eto, M.S., Assistant in Vegetable Crops.
Carolyn Elizabeth Foust, A.B., Assistant in Bacteriology.
Maurice Fried, B.S., Research Assistant in Agronomy.
Georg Frostenson, M.S., Assistant in Agricultural Economics.
Harry Wilson Galbreath, M.S., Assistant in Animal Nutrition.
Lorraine Sibley Gall, B.S., Assistant in Animal Nutrition.
Mirjam van Gelderen, B.S., Research Assistant in Vegetable Crops.
Guy Goble, B.S., Assistant in Entomology.
Fred Morris Gordon, B.S., Assistant in Plant Pathology.
Victor Lionel Guzman, M.S., Research Assistant in Vegetable Crops.
George Gordon Gyrisko, B.S., Research Assistant in Entomology.
Joseph Emery Howland, M.S., Assistant in Floriculture.
Joseph F. T. Jodka, B.S., Research Assistant in Entomology.
Bjorn Johannesson, M.S., Ch.E., Research Assistant in Agronomy.
William Cary Kelly, M.S., Research Assistant in Vegetable Crops.
Earle Wayne Klosterman, M.S.A., Assistant in Animal Husbandry.
Louis Carl Knorr, M.A., Research Assistant in Plant Pathology.
Robert Kunkel, B.S., Research Assistant in Vegetable Crops.
Ellis Weston Lamborn, B.S., Assistant in Agricultural Economics.
Jeanne LaCrenier, A.B., Assistant in Botany.
Clearhos Logothetis, B.S., Assistant in Entomology.
James Hirsch Lorie, A.B., Assistant in Prices and Statistics.

William Frederick Mai, B.Sc., Research Assistant in Plant Pathology.
Julio Oscar Morales, M.S.A., Assistant in Agricultural Economics.
Rosalind Morris, B.S.A., Assistant in Plant Breeding.
Felix Alexander Nylund, M.S., Assistant in Agricultural Education.
Herman E. Pearson, B.S., Assistant in Animal Husbandry.
Richard Frost Pendleton, B.S., Research Assistant in Entomology.
Ruth Alice Petry, A.B., Assistant in Botany.
Robert Marshall Pratt, B.S., Research Assistant in Plant Pathology.
Robert Robison, B.S., Research Assistant in Agronomy.
Ingeborg Rogel, A.B., Assistant in Pomology.
Leona Ora Schnell, M.S., Assistant in Plant Breeding.
Grant Newey Smith, A.B., Assistant in Biochemistry.
Wilson Levering Smith, jr., Ph.D., Research Assistant in Plant Pathology.
Irving Andruss Spaulding, M.S., Assistant in Rural Sociology.
Joseph Henry Stevenson, B.S., Assistant in Agricultural Economics.
Clayton Isaac Swayze, A.B., Assistant in Botany.
Tsuneo Tanabe, B.S., Assistant in Animal Husbandry.
Stefan Taussig, Extension Assistant in Animal Husbandry.
Florence Thomas, M.A., Research Assistant in Plant Breeding and Vegetable Crops.
Janet Alice Urice, B.A., Assistant in Botany.
Noland Leroy Van Demark, B.S., Assistant in Animal Husbandry.
Frances Elizabeth Volz, B.S., Assistant in Animal Nutrition.
Jeremiah Wanderstock, M.S., Assistant in Animal Husbandry.
Kenneth David Wells, M.S. in E., Assistant in Agricultural Education.
George Peter Wene, M.Sc., Research Assistant in Entomology.
Minter Jackson Westfall, B.S., Assistant in Biology.
Natalie Browning Whitford, B.S., Assistant in Botany.
Marjorie Ann Whyte, A.B., Assistant in Entomology.
Mrs. Antoinette Miele Wilkinson, B.A., Assistant in Botany.
Charles Milton Wright, M.S., Research Assistant in Plant Pathology.

STAFF OF EXPERIMENT STATION AT GENEVA

Professors

Ulysses Prentiss Hedrick, M.S., Sc.D., Director, Emeritus.
Percival John Parrott, M.A., D.Sc., Professor of Entomology, Emeritus.
Fred Carlton Stewart, M.Sc., Professor of Plant Pathology, Emeritus.

Robert Stanley Breed, Ph.D., Professor of Bacteriology.
Dwight Clark Carpenter, Ph.D., Professor of Chemistry.
Paul Jones Chapman, Ph.D., Professor of Entomology.
Arthur William Clark, B.S., Professor of Chemistry.*
Reginald Clifton Collison, M.S., Professor of Pomology.
Harold Joel Conn, Ph.D., Professor of Bacteriology.
Hugh Glasgow, Ph.D., Professor of Entomology.
James Morton Hamilton, Ph.D., Professor of Plant Pathology.
Frederick Zeller Hartzell, M.A., Professor of Entomology.
George James Hucker, Ph.D., Professor of Bacteriology.
Zoltan Imre Kertesz, Ph.D., Professor of Chemistry.
James Douglass Luckett, M.S., Professor and Editor.
Mancel Thornton Munn, M.S., Professor of Seed Investigations.
Carl Severin Pederson, Ph.D., Professor of Bacteriology.
Otto August Reinking, Ph.D., Professor of Plant Pathology.
Charles Bovett Sayre, M.S., Professor of Vegetable Crops.

*On leave fall term.

Elmer Henry Stotz, Ph.D., Professor of Chemistry.
Harold Bradford Tukey, Ph.D., Professor of Pomology.
Richard Wellington, M.S., Professor of Pomology.

Assistant Professors

James Alfred Adams, Ph.D., Assistant Professor of Entomology.
Lester Curtis Anderson, B.S., Assistant Professor of Pomology.
Harold Goldsmith Beattie, B.S., Assistant Professor of Chemistry.
Laurence Adams Carruth, Ph.D., Assistant Professor of Entomology.
Willard Francis Crosier, Ph.D., Assistant Professor of Seed Investigations.
Howe Symonds Cunningham, Ph.D., Assistant Professor of Plant Pathology.
Derrill McCollough Daniel, Ph.D., Assistant Professor of Entomology. (In Military Service.)
Ralph Willard Dean, Ph.D., Assistant Professor of Entomology.
John Einset, Ph.D., Assistant Professor of Pomology.
Foster Lee Gambrell, Ph.D., Assistant Professor of Entomology.
Walter Oscar Gloyer, M.A., Assistant Professor of Plant Pathology.
James Davis Harlan, B.S., Assistant Professor of Pomology.
Charles Leonard Hamner, Ph.D., Assistant Professor of Pomology.
Samuel Willard Harman, M.S., Assistant Professor of Entomology.
James Courtenay Hening, M.S., Assistant Professor of Chemistry.
George Edward Romaine Hervey, Ph.D., Assistant Professor of Entomology.
Alvin William Hofer, Ph.D., Assistant Professor of Bacteriology.
George Henry Howe, B.S., Assistant Professor of Pomology.
Hugh Cecil Huckett, Ph.D., Assistant Professor of Entomology.
Frank Andrew Lee, Ph.D., Assistant Professor of Chemistry.
Guilford Leroy Mack, Ph.D., Assistant Professor of Chemistry.
Robert Ogden Magie, Ph.D., Assistant Professor of Plant Pathology.
James Charles Moyer, Ph.D., Assistant Professor of Chemistry.
Frederick George Mundinger, M.S., Assistant Professor of Entomology.
George David Oberle, Ph.D., Assistant Professor of Pomology.
DeForest Harold Palmiter, Ph.D., Assistant Professor of Plant Pathology.
George Whitenack Pearce, M.S., Assistant Professor of Chemistry.
Wilbur Theodore Schroeder, Ph.D., Assistant Professor of Plant Pathology.
John Irwin Shafer, jr., Ph.D., Assistant Professor of Vegetable Crops.
Nelson Jacob Shaulis, Ph.D., Assistant Professor of Pomology.
George Lewis Slate, M.A., Assistant Professor of Pomology.
Ross Frisbie Suit, Ph.D., Assistant Professor of Plant Pathology.
William Thorpe Tapley, M.S., Assistant Professor of Vegetable Crops.
Ellsworth Haines Wheeler, M.S., Acting Assistant Professor of Entomology.

Investigators

Alfred William Avens, Ph.D., Investigator in Chemistry.
Lawrence Matthew Bartlett, M.S., Investigator in Entomology.
Casper Ross Bigelow, M.A., Investigator in Chemistry.
James Lewis Brann, jr., B.S., Investigator in Entomology.
Karl Dietrich Brase, M.S., Investigator in Pomology.
Robert Frank Brooks, Ph.D., Investigator in Bacteriology.
Robert F. Carlson, Investigator in Pomology.
Frederick Warren Hayward, Ph.D., Investigator in Chemistry.
Claude Emerson Heit, B.S., Investigator in Seed Investigations.
Frank Joseph Kokoski, B.S., Investigator in Chemistry.
Frank Kopko, B.Chem., Investigator in Chemistry.
Robert J. McCollach, Investigator in Chemistry.
John Jay McKelvey, M.S., Investigator in Entomology.
Dorothea Elizabeth Metcalf, B.A., Investigator in Bacteriology.

Stewart Reynolds Patrick, B.S., Investigator in Seed Investigations.
Willard Bancroft Robinson, Ph.D., Investigator in Chemistry.
Frederick George Smith, Ph.D., Investigator in Chemistry.
Emil Frederick Taschenburg, Ph.D., Investigator in Entomology.
Lewis Morrell van Alstyne, B.S., Investigator in Pomology.
Joanne Eagar Whitcombe, B.A., Investigator in Chemistry.

ADMISSION AND GRADUATION

The Courses Available

The resident instruction in the College of Agriculture is planned for those who desire training in agriculture and in the sciences most closely related to agriculture. From 70 to 80 per cent of the men graduates of the College go into agricultural pursuits. Besides farming, which is the most common occupation followed, there is a range of related vocations in the professions and in business, for which this College offers training. Some of these vocations in public-supported institutions are teaching vocational agriculture, teaching science, teaching in agricultural colleges, agricultural extension, and work in agricultural experiment stations and in departments of agriculture. In business many graduates have found employment in the manufacture and distribution of feed, fertilizer, farm machinery, spray materials, and other farm supplies; in buying, selling, processing, storing, transporting, and other phases of merchandising farm products; in agricultural credit, advertising, writing, insurance, and other services; in flower growing and distribution and ornamental nursery work; and in many other specialized vocations in which an agricultural-college education has proved useful.

The instruction is organized, for the most part, in a course of four years, or eight terms, leading to the degree of bachelor of science. Those who want instruction in a special field may register for one or more terms as special students, provided they are qualified by education and experience to pursue the courses they want to take. (See page 21.)

For those who cannot plan to take four years of college work, special curricula are organized, running through two years and giving specific training for definite vocational objectives. Transfer from the two-year to the four-year courses is possible under certain conditions which are described in the announcement of two-year courses.

Aside from the above, there is regularly a six-weeks summer school designed especially for teachers, school principals, and superintendents.

There are also one-week and two-weeks courses with specific purposes. Correspondence courses, without credit toward a degree, are available.

The information contained in this announcement applies specifically to the four-year course. Circulars describing the other courses referred to may be obtained on application to the Secretary of the College.

Adjustment to the War

Many young men who enter the College in 1944 will be able to complete no more than one or two terms before being called to military service or to leave for full-time farm employment. Probably their purposes during the freshman year may be served best by one of three

procedures: (1) Some will find instruction with the closest applications to farming and related occupations most useful. (2) Others will need a wide selection of courses in agriculture as a basis for a better occupational and educational adjustment. (3) Many, without doubt, will wish to follow the normal freshman program which emphasizes the study of science as a foundation for further college work.

To provide this flexibility, considerable substitution of agricultural subjects in the regular freshman schedule will be permitted for the duration of the war. While the student will ordinarily decide for himself, with the help of his adviser, whether he wants to make any of these substitutions, some freshmen whose training, experience, and objectives indicate that the best approach to an agricultural college education will be made through the study of agricultural subjects in the first year, will be required to make the substitutions. Applicants held to take such courses will be notified at the time their applications are approved for admission.

The agricultural subjects that may be taken in the freshman year count fully in satisfying requirements for the degree, but the required subjects which they replace must be taken in a subsequent year. Requirements for graduation have not been changed by this arrangement, but the order in which certain subjects are studied may be reversed, by concentrating more on strictly agricultural courses during the freshman year. The details of the freshman schedule and modifications which may be made are described under *Registration for Courses* (page 23). These should be studied carefully.

Because of the shortage of labor on farms, all applicants are urged to spend the full summer at farm work.

Directions Regarding Correspondence

For admission to the freshman class, to the two-year courses, or to advanced standing from other colleges and universities, all communications should be addressed to the Director of Admissions of the University.

For enrollment in correspondence courses, communications may be addressed to the Supervisor of Study Courses in the College of Agriculture.

For admission to graduate work in agriculture and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

The *General Information Number,* giving details concerning admission, expenses, scholarships, and related subjects, may be obtained on application to the Secretary of the University.

The Application for Admission

Admission to the College is not simply a matter of presenting certain specified entrance units. For both the applicant and the College it is of the utmost concern that a proper choice of college work be made,

and the College, therefore, in making its choice of students to be admitted, considers not only the school record submitted but also any other available indications of probable success in the course the student proposes to take. For this reason the applicant should give, in addition to his formal school credentials, the fullest information regarding his background and experience, the quality of his work, his resources for carrying on, and his own purposes in seeking a college education, so that the College may have a better basis for consultation and decision. Correspondence regarding these matters is solicited and, if it is at all possible, applicants should come to the College for an interview.

Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm to familiarize themselves with common farm affairs and operations before entering College. This experience will count toward the requirement in farm practice which must be satisfied by the beginning of the senior year. (See pages 21 and 54.)

Every candidate for admission to an undergraduate course must deposit $25 with the University. Candidates are warned not to send cash through the mails. A check, draft, or money order should be made payable to Cornell University and should be sent to the Office of Admissions, Cornell University. The deposit must be made not later than October 1 if the candidate is to be admitted in November and not later than January 1 if, by exception, he is to be admitted in February.

If the candidate matriculates, the deposit will be credited to his account, $10 for the matriculation fee, $1 for an examination-book fee, and $14 as a guaranty fund, which every undergraduate student is required to maintain and which is to be refunded upon his graduation or permanent withdrawal, less any indebtedness to the University.

If admission is denied a candidate, the deposit is refunded in full at any time.

A candidate may withdraw the application for admission, but a charge of $10 is regularly made for accrued expenses unless the application is withdrawn and a refund of the deposit in full is claimed before October 1. If an application is not withdrawn until after October 1, but is withdrawn before the opening of College, the $10 charged for accrued expenses is deducted and $15 of the deposit is refunded. No refund is made to an applicant who withdraws the application after College opens.

In the case of applications for admission in March, a withdrawal after January 1 incurs the regular charge of $10, and no refund is made for withdrawal after January 31.

Every candidate for matriculation must submit to the Director of Admissions a satisfactory certificate of vaccination against smallpox, not later than October 1 if he is to be admitted in November, or not later than January 1 if he is to be admitted in March. It will be accepted as satisfactory only if it certifies that within the past five years a successful vaccination has been performed or three unsuccessful attempts at vaccination have been made.

Candidates for admission to the four-year course must be at least sixteen years of age. They must have certificates of good moral character; and students from other colleges or universities are required to

furnish certificates of honorable dismissal from those institutions. The academic requirements may be satisfied by the presentation of New York State Regents credentials, or acceptable school certificates, or satisfactory ratings in the tests of the College Entrance Examination Board.

Candidates for admission must file their applications and credentials at the office of the Director of Admissions, Morrill Hall.

Entrance Requirements for the Four-Year Course

The subjects that may be offered for admission to the College of Agriculture are named in the following list; the figures in parentheses following each subject indicate the value in entrance units and show the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study. The War Service Regents Diploma is considered as meeting the entrance requirements in the subjects covered by that diploma.

1. English, 4 years.....(3)
2. 1st to 3rd Year Greek....(1, 2, 3)
3. 1st to 4th Year Latin...(1, 2, 3, 4)
4. 1st to 4th Year German (1, 2, 3, 4)
5. 1st to 4th Year French (1, 2, 3, 4)
6. 1st to 4th Year Spanish (1, 2, 3, 4)
7. 1st to 3rd Year Italian....(1, 2, 3)
8a. Ancient History.....(½–1)
8b. European History .....(½–1)
8c. English History.....(½–1)
8d. Am. History and Civics...(½–1)
9a. Elementary Algebra.....(1)
9b. Intermediate Algebra.....(1)
9c. Advanced Algebra .....(½)
9d. Plane Geometry.....(1)
9e. Solid Geometry.....(½)
9f. Plane Trigonometry.....(½–1)
10. Physics .....(1)
11. Chemistry.....(1)
12. Physical Geography.....(½–1)
13. Biology*.....(1)
13a. General Science.....(1)
14. Botany*.....(½–1)
14a. Zoology*.....(½–1)
15. Bookkeeping .....(½–1)
16. Agriculture, Home Economics.....(½–4)
17. Drawing .....(½–1)
18. Manual Training .....(½–1)
19. Any high-school subject or subjects not already used and acceptable to the University (½–2)

*If an applicant has counted Biology (1), he may not also offer Botany (½) or Zoology (½).

For admission to the New York State College of Agriculture, an applicant must have completed a secondary-school course and must offer either A or B, as follows:

A. Fifteen units which must include English 4 years (3 units), and mathematics, 2 units. The remaining units must be selected from the above list.

B. The New York State Vocational Diploma in Agriculture, with the proviso that 2 units in mathematics are included.

A committee on admissions in the College of Agriculture reviews the credentials of each applicant and in making its decision considers the nature of the subjects offered for admission and the quality of the work done in those subjects, all available indications of ability for and interest in the work of the course to be undertaken in the College, and the background, experience, character, and personality of the

applicant. Where it is considered advisable the committee may require an applicant to take the Scholastic Aptitude Test of the College Entrance Examination Board.

Prospective students who wish to major in one of the sciences or to become research workers should offer adequate training in foreign language.

Admission with Advanced Standing

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, is regarded as having completed the number of terms and hours to which his records entitle him, and receives all the privileges of students who have completed the same number of terms and hours by residence in the College. To obtain the degree of Bachelor of Science, however, he must have completed the prescribed subjects in the four-year course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for his past two terms and have completed not less than 15 hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture. Because advanced-standing credit may reduce the number of summers available for farm work after admission, these applicants are ordinarily held to satisfy a part or all of the farm-practice requirements at entrance, depending upon the number of terms of residence for which they are held.

Credit toward a degree for work done in a preparatory school on subjects that may be offered for entrance to the University is given only to those students who, in addition to satisfying all entrance requirements, pass separate examinations in the subjects for which they seek college credit. These examinations cover substantially the same ground as the university courses in the subject. An applicant desiring a college-credit examination of this kind must apply to the Office of Admissions as early as possible, and in no case later than the day of registration, specifying which fifteen units he intends to offer in satisfaction of the entrance requirements, and on what other entrance subjects he wishes to be examined for credit. If he fails to satisfy the entrance requirements in any one or more of the units on which he proposes to enter, but passes the credit examination in any other subject or subjects, he may use the latter toward satisfying entrance requirements, but in that case he cannot also receive college credit for such subject or subjects.

A student who receives at entrance 12 or more hours of credit in addition to the requirements for admission may be regarded as having satisfied one term of residence. Under no circumstances is surplus entrance credit based on extra work done in a preparatory school accepted as the equivalent of more than one term.

A student who has satisfied the entrance requirements of this College, and has afterwards completed in two or more summer sessions in

Cornell University at least 12 hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Work done in summer sessions is not accepted as the equivalent of more than two terms of residence. The maximum amount of credit toward the degree of bachelor of science which is allowed for the work of any one summer session is 8 hours.

Requirements for Admission of Special Students

Opportunity is provided for the admission of students whose needs may not be well met by the organized curricula of the College. Applicants for admission to such special standing must present entrance credentials as other students do and in addition they must present a detailed statement of the program they desire to follow. They must show that they have had recent farm experience or other experience qualifying them for the special work they plan to do and, unless they offer regular entrance, they must be twenty-one years of age.

Students having a first degree and desiring further undergraduate work may be admitted as special students. The work of such students will ordinarily be limited to courses in the College of Agriculture; for work taken outside, tuition will be charged at the rate prevailing in the college where the work is done.

Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science are residence for eight terms, except for those who make an average of 80 or above, and, in addition to the prescribed work in Physical Training, described on page 79, the completion of 120 hours of required and elective work, as outlined on page 79.

All men students must satisfy the farm-practice requirement before the beginning of the senior year. This requirement is the equivalent of a year or more of farm work. To meet it, students should have a good working knowledge of farm animals, crops, and machinery, and of the ordinary farm operations as they are practiced on a general farm. Students should complete the requirement as early in their course as possible, since it is prerequisite for admission to certain courses. Students specializing in botany, bacteriology, or entomology are allowed to substitute special work in those fields for part or all of the farm-practice requirement. The intention to qualify as a specializing student in one of these subjects should be discussed with the department as early as possible, preferably at the end of the first year, so that there may be opportunity for beginning the practice immediately.

Freshmen are required to attend, during their first term, a course designed to orient students in the life of the University and specifically to acquaint them with the scope and purpose of the courses of instruction in the College. The course meets once a week and carries 1 hour of credit.

The Courses Leading to the Degree of Bachelor of Science

(Those required courses which are given in other colleges than Agriculture are described on pages 78 and 79.)

Freshman Orientation Course 1
English 2 6
Botany, Biology, or Zoology 6
Chemistry or Physics 6
Geology 100 (the requirement may be waived for students presenting geology or physical geography for entrance. In such a case 3 hours are added to the minimum of agricultural electives) 3
Basic sciences and social studies 24
(Not less than 9 hours and not less than 2 subjects under A and not less than 9 hours and 2 groups of subjects under B)

A. Biology, botany, zoology, entomology, bacteriology, physiology, genetics, psychology, chemistry, physics, geology, physical geography, mathematics, meteorology, human growth and development.

B. Economics 1, 2a, 2b.
Government 1, 1a, 2, 9; Agricultural Economics 135, 138.
History 41, 42, 61, 82, 83.
Social Science A, B; Sociology and Anthropology 2; Rural Sociology, 1, 12.

Elective in the College of Agriculture (including any courses listed in this announcement on pages 28 to 78, with exceptions specifically noted) 54
Elective (either in Agriculture or in any other college in the University) 20

Total 120

The Basic Course in Military Science and Tactics, required of male students as described on page 79, is counted in the 20 hours that may be taken in any college. A student who needs to elect up to 20 hours outside the College of Agriculture in addition to the 4 required hours in Military Science and Tactics, may do so on the recommendation of his faculty advisor. He would then have 4 more than the 120 hours required for graduation.

In addition to the requirements listed, men students must take one credit hour a term in physical training each term they are in residence. Women students, who are candidates for degrees, and are required to take five, six, seven, eight, or more terms in residence must similarly take 1 credit hour in physical training during their first one, two, three, or four terms. These courses are described on page 79.

Students who do not present chemistry for entrance are required to take chemistry.

Students who do not present physics for entrance are required to take physics.

Registration for Courses

The standard schedule for the freshman year must include the following courses; but, for the duration of the war, courses offered in the College of Agriculture may be substituted for the work in English, Biological Sciences, and Chemistry or Physics:

Freshman Orientation Course	1
Military Science and Tactics, Basic Course	2
Physical Training	2
English 2	6
Botany 1, Biology 1, or Zoology 1	6
Chemistry or Physics	6
Elective courses in the College of Agriculture	6
Elective in the basic sciences, social studies, or in courses in the College of Agriculture	3–6

In making his program, the student has the assistance of a faculty adviser, preferably from the field in which he expects to specialize. The adviser is ordinarily assigned to new students for their first term, but following that he is chosen by the student.

A student must register for at least 12 hours each term, and no new student may register for more than 18 hours in addition to the required work in Physical Training.

Necessary changes of registration must be made within the first ten days of the term.

Failures in courses, either required or elective, taken outside of the College of Agriculture are counted against the allotment of 20 free hours.

If the students who have met all requirements desire to take courses outside of the College of Agriculture in addition to those required or allowed free, they may do so upon paying for the additional hours at the rate of tuition prevailing in the colleges where the courses are taken.

To be eligible for the degree, the student must maintain an average grade of at least 70 for the entire course.

Courses in Agriculture Open to Freshmen

Agricultural Economics 2, 120, 121, 122
Agricultural Engineering 1, 21, 24, 31, 40, 47, 101, 103
Agronomy A
Animal Husbandry 1, 10, 40, 50, 67, 80, 90
Bacteriology 3
Biology 1, 5
Botany 1
Drawing (mechanical) 1, 2, 5
(freehand) 10, 11
Entomology 12, 41, 51
Extension Teaching 1, 15
Floriculture and Ornamental Horticulture 1, 2, 100
Forestry 1, 2, 3, 23
Meteorology 1
Orientation 1
Plant Pathology 13
Pomology 1, 2
Poultry Husbandry 1, 30, 50
Vegetable Crops 1, 2, 12
Wildlife Conservation and Management 1
Zoology 8, 9

PAYMENTS TO THE UNIVERSITY

Tuition

Tuition is free to undergraduate students pursuing full, special, or short courses in the New York State College of Agriculture, who at the time of their admission are, and for at least twelve months prior thereto have been, bona-fide residents of the State of New York.

Since physical presence in the State, especially in the case of those under age, by no means constitutes legal residence, applicants who are at all doubtful of their own right to exemption should address inquiries in advance to the Director of Resident Instruction in the College of Agriculture.

No student is allowed to transfer from any free-tuition course to another course where tuition is charged without first paying the difference in tuition for the credit transferred.

Students in Agriculture who are not exempt under these provisions are required to pay tuition of $100 a term. Tuition-paying students transferring from the College of Agriculture to other colleges in the University must first make payment of the difference in tuition for the credit transferred. All students registered in the Summer Session, whether or not exempt in the other terms, pay a tuition fee of $60.

Students desiring to take, while registered in the College of Agriculture, courses in other colleges in the University, beyond those specifically required and also beyond the twenty hours allowed free, may do so upon payment of tuition for the additional hours at the rate of tuition in the college in which the work is taken.

Tuition and other fees become due when the student registers. The University allows twenty days of grace after the last registration day of each term of the regular session. The last day of grace is generally printed on the registration coupon which the student is required to present at the Treasurer's office.

Any student, graduate or undergraduate, except as hereinafter provided, who fails to pay his tuition fees and other indebtedness within the time prescribed by the University is thereby dropped from the University. When in his judgment the circumstances in a particular case so warrant it, the Treasurer may allow an extension of time to complete payments. For such extension, the student will be assessed a fee of $2. A reinstatement fee of $5 will be assessed in the case of any student who is permitted to continue or return to classes after being dropped from the University for default in payments. For reasons satisfactory to the Treasurer and the Registrar, which must be presented in writing, the above assessment may be waived in any individual case.

Students entering the armed forces are charged 1/16 of tuition paid for each week or fraction thereof from the first day of instruction to

the date of withdrawal certificate as issued by the College. University fees are charged on the basis of 10 per cent for each week or fraction thereof in attendance.

Any tuition or other fee may be changed by the Board of Trustees to take effect at any time without previous notice.

Other Fees

A *matriculation fee* of $10 is required of every student upon entrance into the University. A new student who has made the required deposit of $25 with the Treasurer does not make an additional payment of the matriculation fee, because the Treasurer draws on the application deposit for this fee. See page 18.

An *examination book fee* of $1 is also deducted from the application deposit. This is used to pay for the examination books furnished to the student throughout his course.

A *University administration fee* of $5 is required of every student in the State Colleges at the beginning of each term.

A *health and infirmary fee* of $10 a term is required of every student at the beginning of each term. For a statement of the privileges given in return for this fee, see the *General Information Number.*

A *Willard Straight Hall membership fee* of $5 a term is required of every undergraduate student at the beginning of each term. Its payment entitles the student to a share in the common privileges afforded by the operation of Willard Straight Hall, subject to regulations approved by the Board of Managers of the Hall.

A *physical recreation fee* of $4 is required, at the beginning of each term, of every undergraduate. Its payment entitles a man student to the use of the gymnasium and the university playgrounds, and to the use of a locker, bathing facilities, and towels, in the gymnasium, Barton Hall, or the Schoellkopf Memorial Building; and a woman student to the use of the woman's gymnasium, recreation rooms, and playgrounds, and to the use of a locker.

Laboratory fees to cover the cost of materials used by the student are charged in courses that require work in laboratory, shop, or drafting room, or field work.

An average allowance of $30 a year will probably cover laboratory fees for most students, though for the first year a larger sum is likely to be required.

Deposits are made in advance at the Treasurer's office in some courses, particularly in Chemistry. Charges for materials used and laboratory expense are entered against the deposits, and at the end of the term any balance remaining is returned to the student.

A *graduation fee* is required, at least ten days before the degree is to be conferred, of every candidate for a degree. For a first, or baccalaureate degree, the fee is $10; for an advanced degree it is $20.

Rules Governing Minor Delinquencies

Every student is held personally responsible for any injury done by him to any of the University's property.

Assessments, charged to the student's account and payable at the Treasurer's office, are levied upon the student in certain circumstances, under the following rules of the University:

A matriculated student desiring to register after the close of registration day must first pay a fee of $5.

A student desiring to file his registration of studies after the date set by his College for filing the same must first pay a fee of $2.

A student desiring to take an examination or other test for the completion of a course in which the grade "absent" or "incomplete" was reported must first pay a fee of $2 for each examination or other test.

A student desiring to make an appointment for the required medical examination or conference after twenty days from the last registration day of the term must pay a fee of $2.

For reasons satisfactory to the proper authority, any of the above-mentioned assessments may be waived in any individual case if the student's failure to comply with the regulation was due to ill health or to any other reason beyond his control. Application for such a waiver should be made to the Secretary of the College, or, in the case of the medical examination, to the Director of the Student Health Service.

Automobiles

As a war measure, the Board of Trustees of the University has ruled that, except by special permission, no undergraduate student while registered in Cornell University may maintain, or for his own benefit operate or have in charge, a motor-driven vehicle in Tompkins County, New York, during the time the University is in session. Special permission may be granted students who show that their physical condition, employment, family responsibilities, or distance of residence make their use of a car imperative. Students who wish to keep a car in Ithaca for use during vacations may also obtain permission, but their licenses must be deposited in the Campus Patrol Office.

Any student who believes he is entitled to have an exception made in his case should, before bringing a car to Ithaca, make application in writing to the Campus Patrol Office, Cornell University, Ithaca, New York.

Students permitted to have cars must register them with the Campus Patrol Office and maintain public liability insurance. For further particulars, see the *General Information Number* or write the Campus Patrol Office.

BOARD AND LODGING

Halls and lodging for men. Trainees for the armed forces are now being housed in all of the University Residential Halls for men.

Many private lodging houses near the University offer furnished rooms, with heat and light, at rates ranging from $3 to $7 a week for a single room. Before he rents a room in a private house, a student should make sure, by a personal inspection, that the sanitary arrangements of the house are good, and he should especially insist on a good fire escape. The University publishes a list of lodging houses that have been inspected and found to be satisfactory in the above respects. New students, if they have not already engaged rooms, are advised to come to Ithaca and do so a few days before the day of registration.

Students rooming in private houses will enter into written contracts. The details of these agreements should be clearly understood at the outset.

The number of private houses that offer both room and board is small, and most students get their meals outside the houses where they live. The College of Home Economics conducts a cafeteria in Martha Van Rensselaer Hall. Other good cafeterias also are patronized mainly by the students.

Board and lodging may be obtained in Ithaca for $12 a week, but this amount would best be regarded as the lowest practicable allowance.

Halls for women. All women students are required to live in the residential halls: Balch Halls, Prudence Risley Hall, and the houses and cottages. In these buildings the total cost of board, allowance of laundry, and rent of furnished room with heat and light is $287.50 a term. Exceptional circumstances which seem to make living outside of these buildings necessary should be taken up with Miss Thelma Brummett, Counselor of Students. Rooms are assigned for the summer term on June 1 in order of application. Rooms for the fall term are assigned on October 1. Inquiries about board and rooms in the women's halls should be addressed to the Manager of Residential Halls, Morrill Hall, Ithaca, New York.

DEPARTMENTS OF INSTRUCTION

With Outlines of Courses That May be Chosen by Regular or Special Students as Agricultural Electives

SPECIAL NOTICES

If an insufficient number of students enroll for any of the courses that are announced for 1944–45, such courses will be cancelled.

Unless otherwise noted, all courses are given in the buildings of the College of Agriculture. Courses inclosed in brackets will not be given in 1944–45.

Courses numbered from 1 to 100 are open to undergraduates generally; courses numbered from 101 to 200 are intended primarily for upperclassmen and graduates; courses numbered from 200 to 300 are intended primarily for graduates.

The main divisions of subject matter under which the courses are arranged are, for the most part, separate administrative units. The exceptions are bacteriology, which is administratively joined with dairy industry, biochemistry with animal husbandry, and meteorology, which goes with pomology; drawing, part of which goes with floriculture and ornamental horticulture and part with agricultural engineering; and the courses in wildlife conservation and game farming, which are given cooperatively.

ORIENTATION

Orientation. Fall term. Credit one hour. Required of all freshmen in Agriculture. One hour a week, to be arranged. Rooms to be announced.

A course designed to orient students in the life of the University.

AGRICULTURAL ECONOMICS

Farm Management

2. **Agricultural Geography.** Fall term. Credit three hours. Open to freshmen. Lectures, W F 11. Warren 225. Laboratory, W 1.40–4. Warren 101. Assistant Professor DeGraff.

The characteristics of agriculture as an industry; its place in the national and world economy; crop and livestock production in New York State, in the United States, and in other countries as determined by natural environment and by historical and economic development; interregional trade in agricultural products. Fee for materials furnished, $3.

102. **Farm Management.** Spring term. Credit five hours. Not open to freshmen. It is desirable that this course should be preceded by as many as possible of the courses dealing with the production of crops and of animals. Lectures, M W F 10. Warren 25. Laboratory, F 1.40–4. Warren 101. On days when farms are visited, the laboratory period is from 1.40–6. Professor Warren.

Farming as a business; simple farm accounts; factors affecting profits; forms of tenure and leases; methods of getting started in farming; choosing a farm; use of capital and credit; planning the organization and management of specific farms. One all-day trip and four half-day trips are taken to visit farms in near-by regions. Fee for materials furnished and for transportation on trips, $6.

103. **Farm Accounting.** Fall term. Credit three hours. Time and room, to be announced. Professor ————.

A course in farm accounting designed to give the student knowledge and practice in setting up, summarizing, and interpreting farm enterprise and cost accounts. Fee for materials furnished, $3.

203. **Business Organization and Management of Successful New York Farms.** Fall term. Credit four hours. Prerequisite, course 102 or its equivalent. F 1.40–4, S 8–10. Warren 101. Professor SCOVILLE.

During the term all-day trips are taken usually on Saturdays. There are two two-day trips, leaving Friday morning and returning Saturday night. Approximate cost of transportation, $20. Fee for materials furnished, $2.

207. **Methods and Results of Research in Farm Management and Land Economics.** Fall and spring terms. Credit two hours each term. Th 4–6. Warren 140. Professors HILL and WARREN, and other members of the departmental staff.

A discussion of research problems in farm management and land economics. Opportunity is given to study special problems suggested by members of the group.

209. **Comparative Agriculture.** Fall term. Credit three hours. Lectures, T Th 11. Warren 125. Laboratory, F 11–1. Warren 101. Professor MISNER.

Study of agriculture of the different countries of the world, with emphasis on the farm-management aspects. Fee for materials furnished, $2.

PRICES AND STATISTICS

Attention is directed to Mathematics 10 (Mathematics for students of economics and statistics) and to Mathematics 400 (Statistics), in the College of Arts and Sciences.

111. **Statistics.** Fall term. Credit three hours. Lecture, M 8. Warren 125. Laboratory, M 1.40–4. Warren 25. Professor PEARSON.

A study of the principles involved in the collection, tabulation, and interpretation of agricultural and marketing statistics. Analysis of statistical problems with an 80-column tabulating machine. Fee for materials furnished, $3.

112. **Statistics.** Spring term. Credit three hours. Prerequisite, course 111. Lecture, M 8. Laboratory, M 1.40–4. Warren 125. Professor ————.

A continuation of course 111. A study of the application of probable error; sampling; gross, partial, and multiple correlation; curve fitting to problems in this field. Methods of using 80-column tabulating equipment for multiple-correlation analysis. Fee for materials furnished, $3.

115. **Prices.** Spring term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, T Th 9. Laboratory, W 1.40–4. Warren 25. Professor PEARSON.

A study of prices of farm products in relation to agricultural and industrial conditions. Fee for materials furnished, $3.

215. **Prices.** Fall and spring terms. Credit one hour a term. Prerequisite, course 115. Open to graduate students only. W 2–4. Warren B-17. Professor PEARSON.

BUSINESS MANAGEMENT

Attention is directed to the courses in administrative engineering in the College of Engineering, in economics in the College of Arts and Sciences, and in administration in the Department of Hotel Administration.

120. **Personal Financial Management.** Fall term. Credit three hours. Lectures, T Th 11. Warren 225. Discussion, T 1.40–4. Warren 240. Associate Professor CURTISS.

Planning an individual's financial program; sources and terms of credit; savings and investments; insurance of property and income; acquisition and disposition of property; provision for dependents. Fee for material furnished, $2.

121. **Financial Statements.** Fall term. Credit three hours. Lectures, M W 11. Warren 225. Discussion and quiz, W 2–4. Warren 201. Professor POWELL.

For persons who wish to understand and interpret the statements of financial condition and income of cooperatives and other businesses. Content of, and relationship between, balance sheet, operating statement, and statement of surplus;

methods of valuing assets; analysis by means of ratios. Fee for materials furnished, $2.

122. **Accounting Method.** Spring term. Credit three hours. Lectures, M W 8. Warren 225. Practice period, M 1.40–4. Warren 201. Professor POWELL.

For persons who wish to understand the records and procedures commonly used in keeping accounts of cooperatives and other businesses. Recording business transactions and deriving financial statements; analyses of costs and budgets. Fee for materials furnished, $1.

126. **Farmers' Cooperatives.** Spring term. Credit three hours. Lectures, T Th 8. Warren 225. Discussion, Th 1.40–4. Warren 201. Professor POWELL.

What cooperatives have tried to do and what they have done; their special problems of organization, finance, and control. Fee for materials furnished, $2.

127. **Business Law.** Fall term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, M W F 8. Caldwell 100. Mr. ALLAN H. TREMAN.

Consideration is given chiefly to legal problems of particular interest to persons who expect to engage in business, including contracts, liens, mortgages, and negotiable instruments; ownership and leasing of property; wills; estates; inheritance taxation; and other practical problems.

PUBLIC ADMINISTRATION AND FINANCE.

Attention is directed to the courses in Government and to Economics 52 (Federal Taxation) in the College of Arts and Sciences.

135. **Local Government.** Fall term. Credit three hours. Two lectures and one laboratory a week. Time and room, to be announced. Professor ————.

Historical development, organization, and operation of local government. Particular attention is given to receipts, expenditures, and administration of counties, towns, and school districts in New York. Fee for materials furnished, $2.

138. **Taxation.** Spring term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, M W F 11. Warren 225. Professor KENDRICK.

A study of the principles and practices of public finance, with emphasis on taxation. Among the topics examined are: the growth of public expenditures; the changing pattern of federal, state, and local taxation; general-property, inheritance, business, and personal-income taxation; and the problem of war finance. Fee for materials furnished, $2.

235. **Problems in Financial Administration.** Fall term. Credit three hours. Primarily for graduate students. Time and room, to be arranged. Professor ————.

Attention is given to a number of problems in governmental financial administration, with special reference to New York, including accounting systems, budgetary procedure, borrowing procedure, and debt and tax limits. Fee for materials furnished, $2.

236. **Problems in Public Administration.** Fall term. Credit three hours. Time and room, to be arranged. Professor ————.

Attention is given to a number of problems in public administration, with special reference to New York, including state and local planning, personnel administration, and administrative organization. Fee for materials furnished, $2.

238. **Seminar in Public Finance.** Spring term. Credit two hours. Primarily for graduate students. W 2–4. Room to be announced. Professor KENDRICK.

An examination of basic problems in public finance.

MARKETING

141. **Marketing.** Fall term. Credit three hours. Lectures, W F 10. Warren 225. Laboratory and discussion: for undergraduates, F 1.40–4. Warren 225; for graduate students, Th 1.40–4, Warren 240. Professor HARPER.

A general course dealing with problems of distribution of farm products. Characteristics of consumer-demand; factors to be considered in judging the best marketing plan from the standpoint of when, where, in what form, and through what channels to sell; public regulation and controls. Fee for materials furnished, $2.

142. **Marketing Fruits and Vegetables.** Fall term. Credit four hours. Lectures, M W F 9. Warren 225. Laboratory, W 1.40–4. Warren 240. Professor RASMUSSEN.

A study of the economic factors involved in the marketing of fruits and vegetables. Regional and seasonal competition; areas of distribution; methods of handling; costs of marketing; types of marketing organizations; sales methods; transportation and carrier services; produce law and methods of credit rating; terminal problems; aspects of retailer- and consumer-demand. Fee for materials furnished,$3.

143. **Marketing Dairy Products.** Spring term. Credit four hours. Lectures, M W F 9. Warren 225. Discussion period, one hour a week by arrangement. Professor SPENCER.

A study of the marketing of fluid milk and other dairy products; facts and principles pertaining to demand, supply, prices, and costs of distribution. Special attention is given to wartime and post-war adjustments and to public regulation. Fee for materials furnished, $2.

144. **Marketing Poultry, Eggs, and Livestock.** Spring term. Credit three hours. Lectures, T Th 10. Warren 225. Laboratory, M 1.40–4. Warren 240. Associate Professor CURTISS.

A study of the economic factors involved in the marketing of eggs, poultry, hogs, cattle, sheep, and wool. Subjects to be considered include: areas of production; distribution channels; sales methods; market costs; cold-storage operations; legislation; demand; terminal market and consumption problems. Fee for materials furnished, $2.

[146. **Milk Distribution and Public Regulation of the Milk Industry.** Spring term. Credit two hours. Professor SPENCER.] Not given in 1944–45.

Lectures and discussions principally by visiting lecturers, including persons connected with milk producer's associations, milk-distribution enterprises, and milk-control agencies.

147. **Marketing Trip to New York City.** Spring term. Credit one hour. Given only if twenty or more students register. Enrollment limited to 40. Associate Professor CURTISS in charge. Representatives of other departments cooperate in the course.

Five days of the spring vacation are spent in New York City inspecting and studying the marketing of dairy products, eggs, poultry, fruits, vegetables, livestock, and meat. A short series of introductory lectures precede the trip, at hours to be arranged. Fee for materials furnished, $2.

A $5 deposit for bus hire and incidental expenses is payable 10 days before the trip. Total cost of the trip need not exceed $30 in addition to transportation to and from New York City.

240. **Research in Marketing.** Fall and spring terms. Credit two hours a term. Designed to be taken continuously by graduate students interested in marketing. W 4–6. Warren 201. Members of the staff will have charge in rotation.

Among the subjects to be considered are: the scope of marketing research; analysis of marketing problems; planning of projects; collecting and analyzing data; presentation of results; critical reviews of marketing research at various institutions.

RURAL ECONOMY

151. **Public Problems of Agriculture.** Spring term. Credit two hours. Open to juniors, seniors, and graduate students. Time and room, to be announced. Professor ————.

A discussion of some of the more important problems of agriculture that involve collective or governmental action. Fee for materials furnished, $1.

152. **Current Problems of Agriculture.** Spring term. Credit one hour. Limited to fifty upperclassmen who have completed the farm-practice requirement. Time and room, to be announced. Professor ————.

Land Economics and Farm Finance

181. **Land Economics.** Fall term. Credit three hours. Open to graduate students and advanced undergraduates. Prerequisite, Farm Management 102 or permission to register. Lectures, T Th 8. Warren 125. Discussion and laboratory, T 1.40–4. Warren 140. Professor Hill.

Physical characteristics of land as related to land use; population; technological advance, institutions, and other factors as they affect land utilization; economics of land use; local, regional, and national land-use problems and policies, including tenancy, land valuation, credit, taxation, and conservation. One or two field trips are taken. The expenses of such trips do not exceed $2.50. Fee for materials furnished, $3.

184. **Farm Finance.** Fall term. Credit three hours. Open to advanced undergraduate students and graduate students. Lecture, Th 10. Lecture and discussion, Th 1.40–4. Warren 125. Professor ————.

A study of the credit institutions which serve agriculture. Fee for materials furnished, $1.

187. **Farm Appraisal.** Spring term. Credit two hours. Primarily for graduate students. Open to undergraduate students who have passed course 102 with a grade of 80 or better. Lecture and laboratory, T 1.40–6. Warren 101. Professor Warren.

A study of factors governing the price of land; methods of land valuation; the appraisal of farms for use, for sale, for purposes of making loans, and for taxation. Fee for materials furnished, $1.

Departmental Seminar and Research

195. **Undergraduate Research.** Fall and spring terms. Credit one to three hours depending upon the problem undertaken and the quality of the work done on it. Open by permission to seniors with grade averages of 80 or more. Departmental staff.

This course is designed to afford opportunity for outstanding seniors to test their ability to do research. The student is expected to complete a research problem under the direction of a staff member.

299. **Seminar.** Fall and spring terms. Open only to graduate students. M 4. Warren 401. Departmental staff.

AGRICULTURAL ENGINEERING

1. **Farm Mechanics.** Fall or spring term. Credit three hours. Prerequisite, reasonable proficiency in drawing; Drawing 1 recommended. Lectures: fall term, T Th 9, Plant Science 37; spring term, T Th 10, Rice 100. Recitation: fall term, M or T 10 or M 11; spring term, M 10 or 11 or T 11. Agricultural Engineering Laboratories. Professor Riley and assistants.

A course planned to give training in understanding the farm application of mechanical methods and appliances and to develop ability to think and to reason in terms of these. Materials fee, $1.

101. **Electricity on the Farm.** Fall or spring term. Credit three hours. Prerequisite, course 1 and high-school or college physics. Lectures, M W 11. Dairy Industry Building 119. Practice, M or T 1.40–4. Agricultural Engineering Laboratories. Associate Professor F. B. Wright.

A study of electricity, electrical wiring, and electrical devices, including motors, with particular emphasis upon the relation of these to the home and the farm. Laboratory fee, $2.50.

102. **Farm Power.** Fall term. Credit three hours. Prerequisite, course 1 and a reasonable proficiency in drawing. Lectures, T Th 8. Caldwell 100. Recitation to be arranged. Practice, T or W 1.40–4. Agricultural Engineering Laboratories. Professor JENNINGS.

A study of the principles of operation and adjustments of single-cylinder and multi-cylinder engines and the care, repair, and adjustments of modern farm tractors. Laboratory fee, $3.

103. **Field Machinery.** Spring term. Credit three hours. Prerequisite, course 1 and a reasonable proficiency in drawing. Lectures, T Th 8. Caldwell 100. Recitation to be arranged. Practice, T or W 1.40–4. Agricultural Engineering Laboratories. Professor JENNINGS.

A study of the use, care, operation, adjustment, and repair of farm field machinery, such as plows, drills, binders, combines, sprayers, potato diggers, and the like. Horse-drawn, as well as tractor, equipment is included. The selection of the size and the type of field equipment best adapted for a specified size of farm is considered. Laboratory fee, $3.

10. **Household Mechanics.** Fall or spring term. Credit three hours. For women students. Not open to freshmen. Lectures, T Th 12. Caldwell 100. Practice: fall term, Th 9–11.30 or Th or F 2–4.30; spring term, Th or F 2–4.30. Agricultural Engineering Laboratories. Professor ROBB and Associate Professor WRIGHT.

A course intended to develop ability to think and to reason in terms of mechanical devices. Among the problems selected for this training are exercises in plumbing, soldering, and power transmission, and studies in the principles of operation, care, and repair of small mechanical devices, sewing machines, domestic electrical equipment, and automobile engines. Laboratory fee, $2.

21. **Farm Engineering.** Fall or spring term. Credit three hours. It is recommended but not required that students have training in mechanical drawing. Lectures: fall term, M W 9; spring term, M W 10. Dairy Industry Building 119. Practice, M or T 1.40–4. Dairy Industry Building, Fourth Floor, and field. Professor MCCURDY.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; leveling for farm drainage and water supply; laying out building foundations. Farm drainage, concrete, and sewage disposal are studied. Laboratory fee, $2.

[121. **Farm Engineering, Advanced Course.** Spring term. Credit two hours. Alternates with course 122. Prerequisite, course 21 or its equivalent. Professor MCCURDY.] Not given in 1944–45.

A course in topographic surveying and mapping; leveling, including cross-section and earthwork computations; a study of the use and adjustment of the better class of levels and of the transit. Laboratory fee, $1.

122. **Drainage and Irrigation.** Spring term. Credit two hours. Alternates with course 121. Prerequisite, course 21 and Agronomy 1 or their equivalents. Lecture, T 10. Dairy Industry Building 119. Field Work, W 1.40–4. Dairy Industry Building 120. Professors ROBB and MCCURDY.

A course covering the principles and practice of drainage and irrigation; laying out drainage for farm lands, golf courses, gardens, and roads; a study of irrigation systems for humid climates; pumping plants for drainage, irrigation, and water supply. One two-day field trip to drainage projects near Ithaca is taken sometime in May. Laboratory fee, $1.

24. **Farm Concrete.** Fall term. Credit two hours. Lecture, T 11. Dairy Industry Building 119. Practice, Th or F 1.40–4. Agricultural Engineering Laboratories. Professor MCCURDY.

A study of the selection, testing, and proportioning of the materials used in making concrete; building forms; mixing, placing, finishing, and curing concrete; waterproofing; inspection of local sand and gravel banks and of some local concrete structures. Laboratory fee, $2.

31. **Farm Structures.** Fall term. Credit three hours. Drawing 1 recommended. Lectures, M W F 8. Fernow 122. Extension Professor GOODMAN.

A study of the plan and structure of the buildings suited to various types of farming, with emphasis on construction, remodeling, insulation, and ventilation. Materials fee, $1.

40. **Farm Shop Work.** Fall or spring term. Credit two hours a term. Open to all students. Section 1, T Th 1.40–4; section 2, M F 1.40–4. Agricultural Engineering Laboratories. Professor ROEHL.

This course includes woodworking, with special jobs in carpentry, cabinet making, and fitting tool handles; metal working, with special jobs in saw fitting, tool grinding, cold-metal working, sheet-metal working, selecting and attaching builder's hardware; forge work, with special jobs in shaping and tempering tools; painting, with special jobs in repairing and refinishing furniture; harness repairing; problems in the use of rope. Mechanical drawing and free-hand sketching are done as they supplement the work. Laboratory fee, $4.

41. **Shop Work for Rural High School Teachers.** Fall or spring term. Credit three hours. Prerequisite, course 40. W 1.40–4 and S 8–12.50. Agricultural Engineering Laboratories. Professor ROEHL.

A course offering training for teaching general shop work related to agriculture in rural high schools. The course includes presentation of purpose, plans, and equipment of shops, organization of course of study, and methods of teaching. In the course one learns how to teach the work outlined in course 40 and other work pertaining to rural life. Laboratory fee, $4.

[46. **Household Carpentry, Furniture Repairing and Refinishing.** Spring term. Credit two hours. For women students. Professor ROEHL.] Not given in 1944–45.

A course in such carpentry-tool work as a housekeeper can make use of; the making and finishing of several small pieces of furniture; each student to refinish a few pieces of furniture supplied by her, and do such repairing as may be necessary. Laboratory fee, $3.

47. **Farm Blacksmithing.** Fall or spring term. Credit one hour. Prerequisite, permission to register. Practice, W 1.40–4.30. Farm Practice Shop. Professor ROBB and Mr. LAYTON.

Welding of iron and ordinary steel such as is used in the parts of modern farm machinery; sharpening, shaping, and tempering of steel tools; miscellaneous forging, such as chain hooks, links, and so forth. Laboratory fee, $3.

48. **Horseshoeing.** Fall or spring term. Credit one hour. Prerequisite, course 47 and permission to register. Practice, M 1.40–5. Farm Practice Shop. Professor ROBB and Mr. LAYTON.

Training in the trimming, shaping, and care of the feet of colts and mature horses, and the selection and fitting of shoes. Laboratory fee, $3.

251. **Special Problems in Agricultural Engineering.** Fall or spring term. Credit one or more hours. Prerequisite, adequate ability and training for the work proposed, and permission to register. Professors and assistant professors of the department.

Special work in any branch of agricultural engineering on problems under investigation by the department or of special interest to the student, provided, in the latter case, that adequate facilities can be obtained. Laboratory fee for welding, $5 for either one- or two-hours credit; other fees appropriate to the work undertaken.

252. **Seminar.** Fall and spring terms. Credit one hour a term. Open to seniors and required of graduate students. T 4.30–5.45.

Presentation and discussion of papers on special problems in agricultural engineering. Professor ROBB.

AGRONOMY

A. **Introductory Agronomy.** Fall or spring term. Credit three hours. Open to freshmen only. Lectures, T Th 9. Laboratory demonstrations, M 1.40–4. Caldwell 100. Professors BUCKMAN and HARTWIG.

An introductory study emphasizing the practical problems of soil and field-crop management. Fee for materials furnished, $2.

SOIL SCIENCE

1. **The Nature and Properties of Soils.** Fall or spring term. Credit five hours. Prerequisite, Chemistry 102 or 104 and Geology 100. Lectures, M W F 9. Caldwell 100. Laboratory: T or W 1.40–4. Caldwell 49. Two recitations, to be arranged. Caldwell 31. Professor BUCKMAN.

A comprehensive course dealing with the composition, properties, and plant relations of soils, with particular reference to the fundamental principles of maintaining soil fertility. Laboratory fee, $3.

6. **Soils.** Fall term. Credit three hours. For two-year students only. Lectures and recitations, M W F 10. Comstock 245. Laboratory, F 1.40–4. Caldwell 143. Professor GUSTAFSON.

A course dealing with the composition, properties, and plant relationships of soils, with particular reference to the practical use of lime, fertilizers, and other means of maintaining soil fertility and of controlling soil erosion. Fee for materials furnished, $1.

101. **Origin, Morphology, Classification, and Mapping of Soils.** Spring term. Credit three hours. Prerequisite, course 1. Lectures, T Th 10. Caldwell 100. Field trips to be arranged. Professor HOWE.

A course dealing with the origin, profile characteristics, classification, and mapping of soils. An important part of the course is devoted to field examination of soils, cartographic expression, and interpretation of soil maps. Cost of field trips is included in laboratory fee. Laboratory fee, $5.

102. **Soil Conservation.** Spring term. Credit two hours. Prerequisite, courses 1 or 6 and 11 or their equivalent. Farm background essential. Lectures, T Th 11. Caldwell 143. Professor GUSTAFSON.

An analysis of the causes of the decline in the inherent productivity of soils and of the practical methods of management that will permanently maintain their productivity. The causes of erosion and its control by agronomic methods receives special emphasis. Two all-day Saturday field trips. Laboratory fee, $4.

[103. **Organic Soils.** Fall term. Credit two hours. Given in alternate years. Prerequisite, course 1 and Chemistry 201. Assistant Professor STAKER.] Not given in 1944–45.

A course designed primarily for students specializing in soil technology. Emphasis is placed on the composition and properties of organic soils. One all-day Saturday field trip. Laboratory fee, $3.

104. **Forest Soils.** Fall term. Credit two hours. Given in alternate years. Prerequisite, course 1 and Botany 31. Lectures, W F 8. Caldwell 143. Associate Professor CHANDLER.

Assigned readings and semi-weekly discussions of the more important forest-soils literature. There are occasional field trips.

106. **Soil Microbiology.** Spring term. Credit three hours. With the approval of the instructor, the lectures without the laboratory may be taken for two-hours credit. Prerequisite, course 1, except for students majoring in bacteriology, Bacteriology 1, and Chemistry 201 or its equivalent. Lectures, M W 8. Caldwell 143. Laboratory, F 1.40–4. Caldwell 201. Professor WILSON.

A course in biological soil processes designed primarily for students specializing in soil technology or bacteriology. The laboratory work is supplemented by reports and by abstracts of important papers on the subject. Laboratory fee, $5.

205. **Soil Fertility, Advanced Course.** Fall term. Credit three hours. Prerequisite, course 1 and Chemistry 201 or its equivalent. Lectures, T Th S 8. Caldwell 143. Professor BRADFIELD.

The lectures are supplemented by reviews of literature and by the preparation of abstracts.

207. **Physical and Chemical Properties of Soils: Lectures.** Spring term. Credit three hours. Prerequisite, course 1, Physics 3 and 4, Chemistry 201. A course in physical chemistry is recommended. Lectures, T Th S 8. Caldwell 143. Professor BRADFIELD.

A study of physical and chemical processes and changes that take place in soils, with emphasis upon their practical application and significance.

208. **Physical and Chemical Properties of Soils: Laboratory.** Spring term. Credit three hours. Must be preceded or accompanied by course 207. Enrollment limited to twelve students. Laboratory, M W 1.40–4. Caldwell 294. Professor BRADFIELD and Associate Professor PEECH.

Laboratory practice in the use of physical and physico-chemical technics used in soil investigations. Laboratory fee, $5.

209. **Research in Soil Science.** Fall and spring terms. Professors BRADFIELD, BUCKMAN, CONN, GUSTAFSON, HOWE, and WILSON, Associate Professors CHANDLER and PEECH, and Assistant Professors STAKER and CLINE.

210. **Special Topics in Soil Science.** Fall and spring terms. Credit one to three hours. Prerequisite, ten credit hours in Soil Science. Time to be arranged.

Topics for 1944–45 to be announced.

FIELD CROPS

11. **Production of Field Crops.** Fall or spring term. Credit four hours. Seniors and juniors are advised to register in the first term. Prerequisite, course 1 and Botany 1. Fall term: Lectures, M W F 10, Caldwell 100; Laboratory, T 1.40–4, Caldwell 250. Spring term: Lectures, M W F 11, Caldwell 100; Laboratory, W 1.40–4. Caldwell 250. Professor HARTWIG.

A course dealing principally with the crops that are used for feeding livestock and poultry. Emphasis is placed on the hay, silage, pasture, and grain crops of the Northeastern States. Cultural methods, crop rotations, fertilizer practices, soil and climatic adaptation, and the better varieties of the important crops, are considered. Laboratory fee, $3.

[211. **Field Crops, Advanced Course.** Spring term. Credit two hours. Given in alternate years. Prerequisite, course 11, Plant Breeding 211, and Botany 31 or their equivalent. Professor HARTWIG.] Not given in 1944–45.

A literature course organized to meet the needs of students specializing in field crops. Current problems involving crops other than pasture are considered. The emphasis is on forage crops. In addition to lectures, papers are assigned for reading and abstracting.

212. **Pastures.** Spring term. Credit three hours. Primarily for graduate students. Juniors and seniors must obtain permission of the instructor. Prerequisite, courses 1 and 11 or their equivalent. Lectures and discussions, T Th 9. Caldwell 143. Laboratory and field trip, Th 1.40–4. Assistant Professor JOHNSTONE-WALLACE.

Special attention is devoted to the principles involved in the improvement and management of pastures in humid temperate climates. Historical and current literature is studied. Laboratory fee, $4.

[213. **Crop Ecology.** Fall term. Credit three hours. Given in alternate years. Prerequisite, course 11 and Botany 31 or their equivalent. Assistant Professor MUSGRAVE.] Not given in 1944–45.

An analysis of the environment of crop plants and their ecological responses, with emphasis on the cereals and on the legumes and grasses used for forage.

219. **Research in Field-Crop Production.** Fall and spring terms. Professor HARTWIG and Assistant Professors JOHNSTONE-WALLACE, MUSGRAVE, and MACDONALD.

DEPARTMENTAL SEMINAR

290. **Seminar.** Fall and spring terms. Required of graduate students taking work in the Department, S 11–12.30. Caldwell 143.

ANIMAL HUSBANDRY

Students intending to specialize in animal husbandry are advised to register for courses 1, 10, and 20 before taking the more advanced courses.

1. **Introduction to Animal Husbandry.** Fall term. Credit three hours. Lectures, W F 10. Wing A. Laboratory, T or F 1.40–4. Judging Pavilion. Professors MILLER, SALISBURY, TURK, and J. P. WILLMAN, and assistants. Professor TURK has charge of the course records.

Introduction to types, breeds, judging, and management of livestock. Laboratory fee, $2.

10. **Livestock Feeding.** Spring term. Credit four hours. Lectures, M W F 9. Wing A. Laboratory, Th or F 1.40–4. Wing C. Professors MILLER and MORRISON and assistants.

The feeding of farm animals, including the general basic principles, feeding standards, the computation of rations, and the composition and nutritive value of livestock feeds.

110. **Principles of Nutrition.** Fall term. Credit three hours. For advanced and graduate students. Prerequisite: a course in human or veterinary physiology, and a course in organic chemistry. Lectures, M W F 10. Wing B. Professor MAYNARD.

The chemistry and physiology of nutrition and the nutritive requirements for growth, reproduction, lactation, and other body functions.

111. **Laboratory Work in Nutrition.** Fall term. Credit three hours. Must be preceded or accompanied by course 110. Registration by permission. M W F 1.40–4. Animal Nutrition Laboratory, Dairy Industry Building. Acting Professor ADOLPH.

This course is designed to familiarize the student with the application of chemical methods to the solution of fundamental problems of nutrition. Laboratory fee, $10; breakage deposit, $5.

112. **War-Emergency Food Problems.** Fall and spring terms. Credit one hour a term. For advanced and graduate students. Registration by permission. M 12. Plant Science 143. Professor MAYNARD.

Lectures and conferences to show the interrelationships between human health, animal production, the application of the modern science of nutrition, and the production and distribution of foodstuffs. Consideration is given to the effect upon human nutrition of the redistribution of food as a result of hoarding, rationing, buying for export, and for the armed forces. Special attention is devoted to problems of feeding the world during the post-war period, and activities of governmental agencies.

213. **Biochemistry of Lactation.** Spring term. Credit one hour. Given in alternate years. Prerequisite, course 110. Hours to be arranged. Dairy Industry Building 164. Associate Professor LOOSLI.

A discussion of the biochemistry of the processes involved in milk secretion and of the composition of milk as related to diet and to the blood precursors.

[214. **Special Topics in Animal Nutrition.** Spring term. Credit one hour. Given in alternate years. Prerequisite, course 110 and Biochemistry 314. Registration by permission. Professor MAYNARD and Associate Professor LOOSLI.] Not given in 1944–45.

A presentation and discussion of the knowledge and techniques of special fields of animal nutrition.

[215. **History of Nutrition.** Fall term. Credit one hour. Prerequisite, course 110 and permission to register. Professor ————.] Not given in 1944–45.
Lectures and conferences on the nutrition of animal species from the invertebrate to man, with special emphasis upon the fundamental discoveries in such fields as growth, comparative biochemistry, and physiology that have been synthesized into the modern science of nutrition.

219. **Seminar in Animal Nutrition.** Fall and spring terms. Credit one hour each term. Open to graduate students only. Registration by permission. Assigned readings on selected topics, with weekly conferences. M 4.15. Professors MAYNARD, NORRIS, and HAUCK.
A consideration of the experimental data on which the principles of animal nutrition are based, and a critical review of current literature.

20. **Animal Breeding.** Fall term. Credit three hours. Prerequisite, course 1 and either Botany 1, Biology 1, or Zoology 1. Lectures, M W 9. Wing A. Recitation, demonstration, or laboratory, T 1.40–4. Wing C. Professor SALISBURY and assistants.
A general outline of the principles of physiology and heredity as applied to the breeding of farm animals. Laboratory fee, $2.

[120. **Problems in Animal Breeding.** Fall term. Credit two hours. Given in alternate years. For seniors and graduate students. Prerequisite, course 20 or Plant Breeding 101. Professor SALISBURY.] Not given in 1944–45.
A consideration of the problems involved in the improvement of the larger farm animals and the application of genetics in their solution.

125. **Endocrinology, Reproduction, and Lactation.** Spring term. Credit two hours. Open to graduate students and upperclassmen. Prerequisite a course in human or veterinary physiology. Lectures, M W 10. Wing B. Professor ASDELL.
A general course in endocrinology, with more detailed consideration of the endocrine processes involved in reproduction and lactation.

126. **Problems in Animal Physiology.** Fall term. Given in alternate years. For graduate students. Hour to be arranged. Dairy Industry Building 160. Professor ASDELL.
Assigned reading and conferences in growth, reproduction, and lactation in mammals.

[229. **Seminar in Animal Breeding.** Fall and spring terms. Th 4.15. Rice 201. Professors HUTT and ASDELL, and members of Poultry Husbandry and Animal Husbandry Staffs.] Not given in 1944–45.

30. **Health and Diseases of Animals.** Fall term. Credit three hours. Not open to freshmen or to those who have had no courses in animal husbandry. Lectures, M W F 11. Veterinary College. Professor BIRCH.
The course is designed to give the student a clear conception of the causes and nature of the diseases of animals, with suggestions for their prevention. Special attention is given to the methods of preventing the spread of the infectious and epizootic diseases. Such information as is practicable is given for the treatment of slight injuries and for first aid in emergencies.

40. **Horses.** Spring term. Credit three hours. Lectures, T Th 9. Wing B. Practice, W 1.40–4. Judging Pavilion. Professor SALISBURY.
A general course treating of the horse and the mule. Judging, care and management, economy in feeding, breeding, and stable management. Origin, history, and development of the breeds of horses. Laboratory fee, $2.

41. **Livestock Judging: Beef Cattle, Horses, Sheep, and Swine.** Fall term. Credit two hours. Prerequisite, course 1. Lecture and laboratory period, W 1.40–4.50. Judging Pavilion. Professor MILLER.
A beginning course in judging market and breeding classes of beef cattle, horses, sheep, and swine, with major emphasis on a detailed study of the type of livestock which best meets present-day demands. Laboratory fee, $2.

[42. **Livestock Judging: Beef Cattle, Horses, Sheep, and Swine.** Spring term. Credit two hours. Students may register for only one laboratory period for one hour of credit by permission of instructor. Prerequisite, course 41 or permission to register. Professor MILLER.] Not given in 1944–45.

A course in judging market and breeding classes of beef cattle, horses, sheep, and swine, with major emphasis on a study of the type of breeding stock which best meets modern demands. One field trip of about two-days duration is made to give additional opportunities to study livestock in outstanding herds or flocks, estimated cost, $10. Laboratory fee, $2.

[43. **Advanced Livestock Judging.** Fall term. Credit two hours. Registration by permission. Professor MILLER.] Not given in 1944–45.

An advanced type of study of purebred market and breeding classes of beef cattle, horses, sheep, and swine. Intended primarily to give additional training to successful students of course 42. Two two-day field trips are taken on week ends; estimated cost, $10. Members of this group are selected to represent the institution in intercollegiate judging competitions. Laboratory fee, $2.

50. **Dairy Cattle.** Spring term. Credit three hours. Lectures, T Th 10. Wing A. Practice, M or Th 1.40–4. Wing A and Judging Pavilion. Professor TURK and assistants.

Origin, history, and development of the breeds of dairy cattle; methods of breeding; economy of feeding; production of milk; care, management, and sanitation of the dairy herd. Practice in judging, scoring, tracing pedigrees, and keeping records. Laboratory fee, $2.

[51. **Advanced Judging, Dairy Cattle.** Spring term. Credit one hour. Must be preceded or accompanied by course 50. Saturdays after Easter recess. Hours by appointment. Successful students may also register for one hour in the succeeding fall term. Professor TURK.] Not given in 1944–45.

150. **Dairy Cattle, Advanced Course.** Spring term. Credit two hours. Prerequisite, course 50. Lecture, T 11. Practice, T 1.40–4. Wing E. Professor TURK.

Analysis of breeding operations in successful breeding establishments. Formulating a breeding program. Selection of foundation females and herd bulls, and special problems in the feeding and management of the purebred dairy herd.

[60. **Beef Cattle.** Spring term. Credit three hours. Professor MILLER.] Not given in 1944–45.

Origin, history, and development of the breeds of beef cattle; herd management; feeding for fattening; practice in judging. Lectures, recitations, discussions, reports, tracing of pedigrees, and field trips. Field trips, two and one-half days total, estimated cost, $6. Laboratory fee, $2.

67. **Beef Cattle and Swine.** Spring term. Credit three hours. Lectures, W F 11. Wing B. Practice, T 1.40–4. Judging Pavilion. If a student has previously had Course 60, Beef Cattle, or Course 70, Swine, this course can be taken with two hours of credit; the student takes the half of the course dealing with the class of livestock he has not previously studied, and prepares a report on a special problem. Professors MILLER and J. P. WILLMAN.

A combined course on beef-cattle production and swine production. Laboratory fee, $2.

[70. **Swine.** Spring term. Credit three hours. Professor J. P. WILLMAN.] Not given in 1944–45.

A general course in the care, feeding, breeding, and management of swine. Lectures, recitations, and discussions; studies in swine selection; field trips and practical exercises in the handling and care of swine. One-day field trip, estimated cost, $4. Laboratory fee, $2.

80. **Sheep.** Fall term. Credit three hours. Lectures, T Th 10. Wing B. Practice, M 1.40–4. Judging Pavilion and Sheep Barn. Professor J. P. WILLMAN.

A general course in the care, breeding, feeding, and management of the farm flock; feeding and fattening of lambs; practice in judging and handling of sheep

and wool. Lectures, recitations, demonstrations, discussions, reports, and field trips intended to give students a practical knowledge of sheep production. One-day field trip, estimated cost, $4. Laboratory fee, $2.

90. **Meat and Meat Products.** Fall or spring term. Credit three hours. Lecture, M 8. Wing B. Two laboratory periods a week, one slaughter section, and one cutting section. Slaughter section, W 1.40–4. Cutting section, M 1.40–4. Professor MILLER and Mr. SCHUTT.

A course in the slaughtering of farm animals, the cutting of carcasses, and the preparing and curing of meats. Laboratory fee, $2.

91. **Meat and Meat Products.** Fall or spring term. Credit two hours. Open to sophomores, juniors, and seniors in Hotel Administration only. Lecture, M 8. Wing B. Laboratory, T 1.40–4. Wing B and Meat Laboratory. Professor MILLER and Mr. SCHUTT.

A course in wholesale and retail buying, cutting, curing, and preparation of meats. Laboratory fee, $2.

92. **Meat and Meat Products.** Fall or spring term. Credit one hour. Open especially to the students of the College of Home Economics. Registration limited to sixteen students. Laboratory and lecture period, Th or F 2–4.20. Wing B and Meat Laboratory. Professor MILLER and Mr. SCHUTT.

A course in wholesale and retail buying, cutting, curing, and preparation of meats. Laboratory fee, $2.

93. **Meat Cutting.** Fall or spring term. Credit one hour. Prerequisite, course 90, 91, or 92. Enrollment limited to five students a section. Laboratory and lecture period, F 1.40–4 or S 8–10.30. Meat Laboratory. Professor MILLER and Mr. SCHUTT.

A course dealing with the principles and practice of meat selection, cutting, and wrapping. Laboratory fee, $2.

200. **Research.** Fall and spring terms. Credit and hours by arrangement. For advanced students only. Professors MORRISON, ASDELL, MILLER, SALISBURY, TURK, and J. P. WILLMAN and Associate Professor LOOSLI.

The amount of the laboratory fee depends upon the nature of the problem undertaken.

201. **Seminar.** Fall and spring terms. Required of all graduate students taking either a major or a minor subject in Animal Husbandry. Advanced undergraduates are admitted by permission, and, if a satisfactory report on an approved subject is presented, may receive not to exceed two-hours credit. M 11. Professor MORRISON and departmental staff.

BACTERIOLOGY

Exemption from the farm-practice requirement because of specialization in bacteriology will be granted only to those students who follow the prescribed courses outlined by the department, whose record in all courses taken in the university approximates an average of 82, and whose record in courses in bacteriology is entirely satisfactory.

1. **General Bacteriology.** Fall term. Credit six hours. Prerequisite, Chemistry 102 or 104. Lectures, M W F 11. Dairy Industry Building 218. Laboratory practice, M W F 1.40–4. Dairy Industry Building 301. Professor SHERMAN, Associate Professor GUNSALUS, Assistant Professor NIVEN, and assistants.

An introductory course; a general survey of the field of bacteriology, with the fundamentals essential to further work in the subject. Laboratory fee, $15.

3. **Agricultural Bacteriology.** Fall term. Credit three hours. Primarily for freshmen and two-year students. Not accepted as prerequisite for advanced courses. Lectures, M W F 9. Dairy Industry Building 218. Professor STARK.

The elements of bacteriology, with a survey of the relation of microorganisms to agriculture.

4. **Household Bacteriology.** Fall or spring term. Credit three hours. Prerequisite, Elementary Chemistry. Limited to students in Home Economics. Fall term: lectures and laboratory, T Th 1.40–4.30. Spring term: lectures, T Th 10. Dairy Industry Building 218. Laboratory, T Th 8–9.50 or T Th 11–12.50. Dairy Industry Building. Professor STARK and assistants.

An elementary, practical course for students in Home Economics. Laboratory fee, $10.

103. **Applied Bacteriology.** Spring term. Credit six hours. Prerequisite, course 1, quantitative analysis, and organic chemistry. Lectures, recitations, and laboratory practice, M W F 1.40–5. Dairy Industry Building 119 and 301. Professor SHERMAN, Associate Professor GUNSALUS, Assistant Professor NIVEN, and assistants.

The important groups of bacteria that are of significance in water, milk, and foods, together with the methods used in the bacteriological analysis and control of these products. Laboratory fee, $15.

105. **Higher Bacteria and Related Microorganisms.** Fall term. Credit four hours. Prerequisite, course 1. Lectures, recitations, and laboratory practice, T Th 1.40–5. Dairy Industry Building 119 and 323. Professor KNAYSI and Mr. BELLAMY.

A study of the higher bacteria, together with the yeasts and molds that are of especial importance to the bacteriologist. Laboratory fee, $15.

106. **Soil Microbiology.** (Same as Agronomy 106.) Spring term. Credit three hours. Prerequisite, course 1 and Chemistry 201 or its equivalent. Lectures, M W 8. Caldwell 143. Laboratory, F 1.40–4. Caldwell 201. Professor WILSON.

A course in biological soil processes designed primarily for students specializing in soil technology or bacteriology. The laboratory work is supplemented by reports and by abstracts of important papers on the subject. Laboratory fee, $5.

Pathogenic Bacteriology. (See the *Announcement of the New York State Veterinary College.*)

210. **Physiology of Bacteria.** Fall term. Credit two hours. Prerequisite, course 1, at least one additional course in bacteriology, and one in organic chemistry. Lectures, T Th 8. Dairy Industry Building 120. Professor RAHN.

The physiology of bacteria and the biochemistry of microbic processes.

201a. **Physiology of Bacteria, Laboratory.** Spring term. Credit three hours. Must be preceded by course 210. M 11 and M W 1.40–5. Dairy Industry Building. Professor RAHN and assistant.

A laboratory course dealing with the biological principles of growth, fermentation, and death of bacteria. Laboratory fee, $15.

211. **Taxonomy of Bacteria.** Spring term. Credit two hours. Prerequisite, four terms of bacteriology. Lectures, W F 11. Dairy Industry Building 120. Professor RAHN.

The principles and methods used in the classification of bacteria, and the difficulties encountered because of variability.

212. **Selected Topics in Bacteriology.** Fall and spring terms. Credit one hour a term. For seniors and graduate students. F 8. Dairy Industry Building 120. Professor RAHN.

The topics change each term. The topics are: *The Yeast Industries; Bacteriology of Water and Sewage; Food Industries; Disinfection.*

213. **Morphology and Cytology of Bacteria.** Fall term. Credit three hours. For seniors and graduate students. Lectures, T Th S 9. Dairy Industry Building 119. Professor KNAYSI.

The morphology, cytology, and microchemistry of microorganisms.

215. **Chemistry of Bacterial Processes.** Spring term. Credit two hours. For seniors and graduate students. Lectures, T Th 8. Dairy Industry Building 119. Associate Professor GUNSALUS.

The chemistry of metabolism, fermentation, and nutrition of microorganisms.

220. **Research.** Fall or spring term. Credit one or more hours, by arrangement. For advanced students.

Special problems in any phase of bacteriology may be elected.

221. **Seminar.** Fall and spring terms. Without credit. Required of graduate students specializing in the department; open to undergraduate students taking advanced work. Hours to be arranged. Dairy Industry Building. Professor SHERMAN.

BIOCHEMISTRY

314. **Elementary Biochemistry.** Fall term. Credit three hours. Prerequisite, Chemistry 375 or the equivalent. Lectures, M W 12. Conferences, F 12. Dairy Industry Building 218. Professor SUMNER and Dr. THOMPSON.

The substances met with in living things, and the chief facts of digestion, metabolism, and nutrition.

314a. **Laboratory Work in Biochemistry.** Fall term. Credit three hours. Prerequisite or parallel, course 314. M W F 1.40–4, or T 1.40–4 and S 8–1. Dairy Industry Building 175. Professor SUMNER, Doctor THOMPSON, and assistants.

Laboratory fee, $10; Breakage deposit, $5.

320. **Biochemistry, Advanced Lecture Course.** Fall term. Credit three hours. Prerequisite, one term of Chemistry 305 and one term of Chemistry 310, or the equivalent, including introductory courses in qualitative and quantitative analysis. Lectures, M W F 9. Wing B. Professor SUMNER and Doctor THOMPSON.

The biological and physical chemistry of lipids and carbohydrates.

321. **Biochemistry, Advanced Laboratory Course.** Fall term. Credit two hours. Prerequisite, or parallel, course 320 or 322. Laboratory, M W 1.40–4. Dairy Industry Building 175. Professor SUMNER and Dr. THOMPSON.

Laboratory experiments with lipids and carbohydrates. Laboratory fee, $15; breakage deposit, $5.

322. **Biochemistry, Advanced Lecture Course.** Spring term. Credit three hours. Prerequisite, one term of Chemistry 305 and one term of Chemistry 310, or the equivalent, including introductory courses in qualitative and quantitative analysis. M W F 9. Dairy Industry Building 218. Professor SUMNER and Doctor THOMPSON.

The biological and physical chemistry of proteins, enzymes, and related substances.

323. **Biochemistry, Advanced Laboratory Course.** Spring term. Credit two hours. Prerequisite, or parallel, course 320 or 322. Laboratory, M W 1.40–4. Dairy Industry Building 175. Professor SUMNER and Dr. THOMPSON.

Laboratory experiments with proteins and enzymes. Laboratory fee, $15; breakage deposit, $5.

Discussion of new research articles, recent books, and new developments.

325. **Biochemistry, Research Work.** Fall and spring terms. Credit to be arranged. Prerequisite, courses 321, 322, and 323. Laboratory hours to be arranged. Dairy Industry Building 175. Professsor SUMNER and Doctor THOMPSON.

Laboratory fee, $3 a credit hour; breakage deposit, $5.

600a. **Food Chemistry and Nutrition.** Fall term. Credit two hours. Primarily for students in the School of Chemical Engineering. Prerequisite, Chemistry 305 and 310 or Chemistry 375. Lecture and discussion periods, T Th 10. Olin Hall. Assistant Professor GORTNER.

A study of the chemistry of the essential nutritive substances, with special emphasis upon the factors affecting their stability, and of the functions of these substances in maintaining optimum nutritional status.

600b. **Food Processing and Nutrition.** Spring term. Credit two hours. Prerequisite, course 316 or Animal Husbandry 110. Lecture and discussion periods, T Th 10. Olin Hall. Assistant Professor GORTNER.

A study of the principles of food preservation, of the chief manufacturing processes used in preserving foods, and of the effect of food processing upon the maintenance of nutritive value.

BOTANY

Students wishing instruction in special groups of plants or in special subjects should consult the department.

1. **General Botany.** Fall and spring terms. Credit three hours a term. If taken after Biology 1, credit two hours a term. Lectures: fall term, T Th 11; spring term, W F 10. Plant Science 233. Laboratory, one period of two and one-half hours. Plant Science 240, 242, and 262. Professor PETRY, instructors, and assistants.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants. Laboratory fee, $3.50 a term.

13. **Trees and Shrubs.** Fall term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 9. Plant Science 143. Laboratory or field work, T Th 1.40–4. Plant Science 211. Associate Professor CLAUSEN.

The identification of trees and shrubs in summer and in winter conditions. During the first part of the term the work on identification is done largely in the field. The work of the latter part of the term is devoted to a study of the classification of woody plants. Laboratory fee, $4; deposit, $5.

51. **Economic Botany.** Fall term. Credit three hours. Lectures, T Th 8. Laboratory, M 1.40–4. Plant Science 353. Professor MUENSCHER and assistant.

A treatment of the source, distribution, cultivation, and utilization of the principal economic plants of the world. Special emphasis is given to morphological and ecological characteristics of the crop plants that supply the chief sources of products utilized for foods, beverages, drugs, fibers, and shelter. Laboratory fee, $3.

55. **Weeds and Poisonous Plants.** Fall term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, F 8. Laboratory, W F 1.40–4. Plant Science 353. Professor MUENSCHER and assistant.

Special emphasis is given to the habits, characteristics, and properties which make weeds and poisonous plants harmful or undesirable, the losses and injury produced by them, and the methods for their prevention, eradication, and control. Field and laboratory practice in the identification of common weeds and poisonous plants is included. Laboratory fee, $3.

56. **Seed Analysis.** Spring term. Credit one hour. Prerequisite, Course 1 or its equivalent. Lectures and laboratory, F 1.40–4. Plant Science 353. Professor MUENSCHER and assistant.

A course designed for students in the applied plant-science departments and those interested in preparing to be seed analysts. Practice is given in making purity analyses and germination tests according to standard and official methods and recommendations. Opportunity is provided for practice in the identification of weed-seed impurities and in the application of special treatments required for germinating dormant seeds. Laboratory fee, $1.

115. **Aquatic Plants.** Spring term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, M 9. Laboratory, M W 1.40–4. Plant Science 353. Professor MUENSCHER.

A study of the taxonomy and ecology of fresh-water plants, beginning with the algae and concluding with the aquatic angiosperms. Laboratory fee, $4.

117. **Taxonomy of Vascular Plants.** Spring term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 9. Plant Science 143. Laboratory, T Th 1.40–4. Plant Science 211. Associate Professor CLAUSEN.

A study of the kinds of seed plants and ferns, their classification into genera, families, and orders, and field work on the local flora. Emphasis is placed on wild plants, but the more common cultivated plants receive some attention. The

course is planned to follow course 1 and to furnish an introduction to the knowledge of field botany and classification of the higher plants, in preparation for special work in various departments, and as an aid in teaching. Instruction is given in the preparation of an herbarium and of keys. Laboratory fee, $4; deposit, $5.

Several afternoon and one or two all-day field trips are scheduled in May. Students completing this course may arrange, under course 171, to pursue special advanced work in taxonomy.

219. **Advanced Taxonomy of Vascular Plants.** Fall term. Credit two hours. Prerequisite, course 117 or its equivalent and training in cytology and genetics. Lecture, T 11. Practice, Th 11. Plant Science 211. Associate Professor CLAUSEN.

A course designed particularly for students majoring in taxonomy. Emphasis is placed on the three phases of taxonomic study: floristics, experimental taxonomy, and monographing. The work of the first part of the term is done largely in the field. In the latter part of the term, each student does practical work on some group of plants. Laboratory fee, $1.

123. **Plant Anatomy.** Fall term. Credit four hours. Prerequisite, course 1 or its equivalent, and permission to register. Lecture and laboratory, T 9–12.30; Th S 9–11.30. Plant Science 228. Dr. BLASER.

This course is designed to give a working acquaintance with the internal morphology of vascular plants, and emphasis is placed on practice in interpretation and determination of material. The course is planned primarily for students in applied fields of botany, such as pathology, pomology, or genetics. Laboratory fee, $5.

124. **Cytology.** Fall term. Credit four hours. Prerequisite, course 1 or Zoology 1 or its equivalent. Conferences, M W 9. Plant Science 143. Laboratory, M W or T Th 10–12.30. Assignment to laboratory section must be made at time of registration. Plant Science 219. Professor L. W. SHARP.

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, taxonomy, and heredity. Both plant and animal materials are used. Microtechnic is not included. Laboratory fee, $5.

224. **Advanced Cytology.** Spring term. Credit two hours. Prerequisite, course 124. Plant Breeding 101, and permission to register. Lecture, W 9. Plant Science 143. Laboratory and seminar to be arranged. Professor L. W. SHARP.

An advanced course dealing mainly with the physical basis of heredity and with recent researches in cytogenetics and cytotaxonomy.

126. **Morphology of Vascular Plants.** Fall and spring term. First term is prerequisite to second. Credit three hours a term. Prerequisite, course 1 or its equivalent, and permission to register. Lecture, F 9. Plant Science 143. Laboratory, W 9–12.30, F 10–11.30. Plant Science 228. Professor EAMES.

An advanced course in the comparative morphology, life histories, and phylogeny of vascular plants. Laboratory fee, $5.

Comparative Morphology of Fungi. Given in the Department of Plant Pathology.

31. **Plant Physiology.** Fall or spring term. Credit four hours. Prerequisite, course 1 and introductory chemistry. Lectures, T Th 10. Plant Science 143. Laboratory, T Th 1.40–4. Plant Science 227. Professors KNUDSON, O. F. CURTIS, or Associate Professor CLARK, and assistants.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. Particular emphasis is placed, both in laboratory and classroom, on the discussion of principles and their application to plants. Laboratory fee, $4; deposit, $3.

231. **Plant Physiology, Advanced Lecture Course.** Fall and spring terms. Credit three hours a term. Limited to seniors and graduate students. Prerequisite,

training in botany and chemistry, to be determined in each case by the department. Lectures, M W F 10. Plant Science 143. Professors KNUDSON and O. F. CURTIS.

232. **Plant Physiology, Advanced Laboratory Course.** Fall and spring terms. Credit three hours a term. Prerequisite or parallel, course 231. Laboratory, M 1.40–4, S 8–12.30. Plant Science 241. Professors KNUDSON and O. F. CURTIS and Associate Professor CLARK. Laboratory fee each term, $10; breakage deposit, $5.

233. **Seminar in Plant Physiology.** Fall and spring terms. Required of graduate students taking work in the department. Conference, F 11. Plant Science Seminar Room. Professors KNUDSON and O. F. CURTIS, and Associate Professor CLARK.

The presentation and discussion of current contributions to plant physiology; reports on the research problems of graduate students and members of the staff.

[161. **History of Botany.** Spring term, without credit. Hours to be arranged.] Not given in 1944–45.

A course of lectures given by various members of the staff with the purpose of acquainting advanced students of botany with the historical development of their science.

171. **Special Problems in General Botany, Taxonomy, Morphology, Anatomy, Paleobotany, Economic Botany, Cytology, and Physiology.** Fall and Spring terms. Credit not less than two hours a term. By appointment. Professors KNUDSON, EAMES, L. W. SHARP, O. F. CURTIS, PETRY, MUENSCHER, and L. F. RANDOLPH, and Associate Professors CLARK and CLAUSEN.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem. The laboratory fee depends on the nature of the work and on the number of credit hours.

DAIRY INDUSTRY

Students intending to specialize in Dairy Industry are urged to elect qualitative and quantitative analysis, organic chemistry, and general bacteriology, in order that these courses may be completed by the end of the first term of the junior year.

1. **Introductory Dairy Science.** Fall term. Credit three hours. Prerequisite, Chemistry 102 or 104. Lectures, T Th 11. Dairy Industry Building 218. Laboratory, M or T 1.40–4.30 or S 9–12. Dairy Industry Building 209. Professor HERRINGTON and Mr. WHITE.

The scientific and practical aspects of milk and a survey of the dairy industry. Especial attention is given to the composition of milk and its physical and chemical properties, quantitative tests for fat and other constituents. Laboratory fee, $7.

[4. **Production and Care of Milk.** Spring term. Credit two hours. Extension Professor BRUECKNER.] Not given in 1944–45.

The production, care, and processing of milk on the farm. The composition and nutritive properties of milk; the bacteriology of milk and milk sanitation; laws pertaining to milk; milk flavor and abnormalities. Fee to cover materials, $2.

5. **Technical Control of Dairy Products.** Spring term. Credit one hour. Prerequisite, course 1. Lecture and laboratory practice, Th 1–6. Three sections of one-third term each. Dairy Industry Building 120. Professor HERRINGTON and Mr. ————.

The analysis of dairy products by factory methods. Laboratory fee, $5.

[102. **Market Milk.** Spring term. Credit five hours. Prerequisite, course 1, and Bacteriology 1 or its equivalent. Professor BRUECKNER and Mr. KOSIKOWSKY.] Not given in 1944–45.

The scientific, technical, and sanitary aspects of the fluid-milk industry. Laboratory fee, $10.

[103. **Milk-Products Manufacturing.** Fall term. Credit five hours. Prerequisite course 1, and Bacteriology 1 or its equivalent. Professor GUTHRIE and Assistant Professor AYRES.] Not given in 1944–45.

The principles and practice of making butter, cheese, and casein, including a study of the physical, chemical, and biological factors involved. Consideration is given also to commercial operations and dairy-plant management. Laboratory fee, $10.

[104. **Milk-Products Manufacturing.** Spring term. Credit five hours. Prerequisite, course 1; should be preceded or accompanied by course 5. Assistant Professor AYRES.] Not given in 1944–45.

The principles and practice of making condensed and evaporated milk, milk powders, ice cream, and by-products, including a study of the physical, chemical, and biological factors involved. Laboratory fee, $10.

[108. **Commercial Grades of Dairy Products.** Spring term. Credit one hour. Should be preceded by courses 103 and 104. Professor GUTHRIE and Assistant Professor AYRES.] Not given in 1944–45.

The classification of dairy products and the factors involved in grading them. Laboratory fee, $5.

111. **Analytical Methods.** Spring term. Credit four hours. Prerequisites, quantitative analysis. Lectures, T Th 10. Laboratory practice, T 1–5. Dairy Industry 120. Professor HERRINGTON and Dr. LAWRENCE.

The chemical analysis of products and materials important in the dairy and food industries. Laboratory fee, $10.

[112. **Chemistry of Biological Materials.** Fall term. Credit three hours. Prerequisite, analytical and organic chemistry, and college physics. Associate Professor HAND.] Not given in 1944–45.

A fundamental treatment of the physico-chemical processes occurring in living cells and other biologic materials.

113. **Chemistry of Milk.** Fall term. Credit two hours. Prerequisite, qualitative and quantitative analysis and organic chemistry; must be preceded or accompanied by course 112 or its equivalent. Lectures, M W 8. Dairy Industry Building 119. Professor HERRINGTON.

A consideration of milk from the physico-chemical point of view.

Dairy Bacteriology (See Bacteriology 103.)

[220. **Chemistry of Milk Products.** Spring term. Credit four hours. Prerequisite, course 113. Professor P. F. SHARP.] Not given in 1944–45.

An advanced consideration of the chemical and physical aspects of milk products.

251. **Research.** Fall or spring terms. Credit one or more hours, by arrangement. For advanced students.

Special problems in any phase of dairy work may be elected.

252. **Seminar.** Fall and spring terms. Without credit. Required of graduate students taking work in the department; open to undergraduate students taking advanced work. Hours to be arranged. Dairy Industry Building. Professor SHERMAN.

DRAWING

1. **Mechanical Drawing.** Fall or spring term. Credit three hours. Lectures during laboratory periods. Laboratory: section 1, T 1.40–4 and S 10.30–12.30; section 2, W F 1.40–4. Two additional practice periods to be arranged to suit the schedule of the student. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

A course dealing with the principles and practices involved in the art of conveying information by graphical methods. The work includes use of instru-

ments; lettering; orthographic projection involving plans, elevations, and sections; isometric drawing; and the practical applications of these principles to simple problems. This course may well be taken early by students interested in agricultural engineering. Materials fee, 50 cents.

2. **Mechanical Drawing.** Fall or spring term. Credit one hour. Lectures during laboratory periods. Laboratory, T W or F 1.40–4. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

A course dealing with the simple representation of objects as needed in practical applications. Materials fee, 50 cents.

5. **Mechanical Perspective Drawing.** Fall or spring term. Credit two hours. Lectures during laboratory periods. Laboratory, Th 1.40–4, S 10.30–12.30. Dairy Industry Building, Fourth Floor. Assistant Professor REYNA.

A course in perspective representation by mechanical methods, embracing all the fundamentals necessary for practical application to architectural or shop problems. Laboratory fee, 50 cents.

10. **Free-Hand Drawing.** Fall or spring term. Credit two hours. Practice, W F 1.40–4.30. Plant Science 433. Mr. ————.

A course for beginners in landscape design including some mechanical drawing and perspective. Laboratory fee, $1.

11. **Free-Hand Drawing.** Fall and spring terms. Credit from two to four hours a term. One hour of credit means three hours of actual practice. Lectures during practice. Practice by appointment, daily 9–12.50 and 1.40–4, except S morning. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

An elementary course for the development of graphic expression applicable to scientific studies. Of special value to those who expect to enter the field of teaching, nature study, or biological research. Laboratory fee, $1.

12. **Free-Hand Drawing, Advanced Course.** Fall and spring terms. Credit from two to four hours. Prerequisite, two hours of course 11 or its equivalent. Lectures during practice. Practice same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

Laboratory fee, $1.

13. **Pen-and-Ink Drawing.** Fall and spring terms. Credit from two to four hours. Prerequisite, two hours of course 11 or its equivalent. Practice, same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

Laboratory fee, $1.

14. **Water Color.** Fall and spring terms. Credit from two to four hours. Prerequisite, two hours of course 11 or its equivalent. Practice, same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

Laboratory fee, $1.

15. **Free-Hand Perspective and Rendering.** Fall or spring term. Credit three hours a term. Prerequisite, two hours of course 11. Lectures and criticisms, T Th 12. Drafting periods according to schedule of student. East Roberts 341. Assistant Professor GARRETT and Mr. ————.

A course in appearance drawing from data, with special emphasis on representation of tree forms and foliage; intended primarily for landscape-service students. Laboratory fee, $1.

16. **Picture Study.** Fall or spring term. Credit one hour a term. Open to sophomores, juniors, and seniors who have had at least two hours of Free-Hand Drawing. Registration limited to twelve students. Lectures, W F 12. East Roberts 341. Assistant Professor GARRETT.

An introductory course in fundamentals of design. Various media are used in making compositions in line, tone, and color, the aim being to increase appreciation of the graphic arts.

ENTOMOLOGY AND LIMNOLOGY

For related work, see the courses listed under the heading *Zoology* in this announcement, and in the announcement of the College of Arts and Sciences.

Biology

1. **General Biology.** Fall and spring terms. Credit three hours a term; both terms of the course must be completed to obtain credit, unless the student is excused by the department. The course may be started in either term. Not open to students who have had both Zoology 1 and Botany 1. If Biology 1 is taken after either Zoology 1 or Botany 1, credit two hours a term. Lectures and demonstrations, M W 9 or 11. Roberts 392. One laboratory a week, M T W Th or F 1.40–4. Roberts 301 and 302. Associate Professor Hood and assistants.

An elementary course planned to meet the needs of students majoring outside of the plant and animal sciences; particularly adapted as the first year of a two-year sequence in biology for the prospective teacher of general science in the secondary schools. The course deals with the nature of life, life processes, the activities and origin of living things. It covers the organization of representative plants and animals, including man as an organism, and the principles of nutrition, growth, behavior, reproduction, heredity, and evolution. Fee, $3.50 a term.

[5. **Laboratory Methods in Biology.** Spring term. Credit either two or three hours. Prerequisite, basic science training. Roberts 302.] Not given in 1944–45.

For students who intend to teach or to follow some phase of biology as a profession. This course includes such subjects as: laboratory equipment; collection, preservation, and storage of materials; sectional and non-sectional preparations of animal tissues for histological study; injection of blood vessels and embalming; preparation of bird and mammal skins for study; chart making; introduction to photography including the preparation of lantern slides; use of micro projector; theory and use of 16-millimeter sound and silent projection apparatus. Laboratory fee, $5 or $7.50.

General Entomology

Students accepted for major work in entomology must complete, before graduation, three hours in general entomology, six hours in insect morphology, one hour in wing venation, six hours in insect taxonomy, three hours in economic entomology, three hours in either insect physiology or insect ecology, six hours in college physics, six hours in college chemistry, and the equivalent of one college year in French and the same in German. They must also satisfy a requirement in entomological field practice.

A student planning to major in entomology must make application to the Department, preferably at the end of his first year, and he must at the same time give notice of this action to the Office of Resident Instruction. To be acceptable as a major student he must have maintained and continue to maintain an average of at least 80 in his work in natural sciences (physics, chemistry, geology, biological subjects).

Major students in entomology must meet the farm-practice requirement applicable to students of the College generally, except that the required minimum of entomological field practice, together with additional work as outlined by the Department, may be substituted for farm practice. Whatever the combination of farm experience and entomological experience that is presented, the work must be completed under the same provisions as those specified for the farm-practice requirement.

12. **General Entomology.** Fall term. Credit three hours. Prerequisite, Biology 1, Zoology 1, or Botany 1. Lectures, W F 9. Comstock 245. Professor Matheson. Practical exercises, T W Th or F 1.40–4, or S 8–10.30. Comstock 200. Professor Matheson and Miss Whyte.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species; practical exercises in studying the structure of insects, their biology, and their classification. Laboratory fee, $2.50.

15. **Wing Venation and Evolution.** Fall term. Credit one hour. Must be preceded or accompanied by course 12. Required of all students who plan to

take advanced work in entomology. Lecture, T 12, and an additional one and one-half hours during Tuesday morning, by arrangement. Comstock 300. Professor BRADLEY.

A laboratory study of evolutional series as illustrated by progressive modification of the wings of insects.

16. **Insect Ecology.** Fall term. Credit three hours. Prerequisite, Biology 1 or Zoology 1, and Entomology 12. T Th 9. Comstock 145. Laboratory, Th 1.40–4. Comstock 110. Professor PALM.

A general study of insects in relation to their environment. Attention is given to life-history studies in the field and insectary; the rôle that insects play in different natural associations; the relations between structure, instinct, habitat, and ways of living. Photographing insects in the field and laboratory is included as a part of the course. Laboratory fee, $3.50.

118. **The Technics of Biological Literature.** Fall term. Credit three hours. Lectures, M F 11. Comstock 300. Library work by assignment. Professor BRADLEY.

A critical study of the biologists' works of reference. Practice in the use of generic and specific indices and of bibliographies, and in the preparation of the latter; methods of preparing technical papers for publication; zoological nomenclature. This course is of a technical nature, and is intended to aid students specializing in zoology or entomology in their contact with literature.

INSECT MORPHOLOGY

122. **Insect Morphology, Anatomy, and Histology.** Fall and spring terms. Credit three hours a term. Prerequisite, course 12. Lecture, T 10. Comstock 145. Laboratory, M W 1.40–4. Comstock 270. Doctor BUTT.

A study of external and internal anatomy of insects. Laboratories include gross dissection and histological studies of internal organs of representative insects. Laboratory fee, $3.

123. **Insect Embryology and Post Embryonic Development.** Spring term. Credit two hours. Prerequisite, courses 12 and 122. Lecture and laboratory, hours by appointment. Comstock 270. Doctor BUTT.

Lectures with assigned reading and reports by students. Laboratory fee, $3.

124. **Insect Histology: Technic.** Fall or spring term. Credit two hours. Prerequisite, courses 12 and 122. Two laboratories a week by appointment. Comstock 265. Doctor BUTT.

The technic of preparing, sectioning, and mounting insect tissues for study. Laboratory fee, $3.

INSECT TAXONOMY

30. **Taxonomy of Insects.** Spring term. Credit two hours. Prerequisite, course 12. Laboratory, T Th 1.40–4. Comstock 300. Mr. PATE.

A study of the orders and families of insects, their distinguishing characteristics, distribution, and nomenclature. Attention is given to the use and construction of keys as well as to the literature of taxonomic entomology. Laboratory fee, $3.

[32. **Classification of Aquatic Insects.** Fall term. Credit two hours. Prerequisite, course 12. Professor BRADLEY and Mr. PATE.] Not given in 1944–45.

This course is intended primarily for students preparing to take limnology. Laboratory fee, $4.

34. **Entomotaxy.** Spring term. Credit two hours. Not given until after the completion of assigned summer work. Laboratory and field trips, F 1.40–4 and S 10.30–1. Comstock 300. Field trips last until 5. Two all-day field trips. Professor BRADLEY.

Methods of collecting insects and of preserving them for study. Work is assigned to be completed during the summer and fall and to be reported on subsequently. Laboratory fee, $2.25, and expense of trips.

131. **The Phylogeny and Classification of Insects.** Fall term. Credit four hours. Prerequisite, course 30, and must be preceded or accompanied by courses 15 and 122. Lectures, W F 10. Laboratory, T Th 1.40–4. Comstock 300. Professor BRADLEY and Mr. PATE.

Lectures on the evolution and classification of the orders and families of insects, living and extinct, and on their comparative morphology and bionomics; a laboratory study of the taxonomic literature on insects (exclusive of the larger orders of Holometabola) and of the classification and characters of representative genera and species. For continuation, see courses 133 and 134. Laboratory fee, $3.

[133. **Taxonomy of the Holometabola: Diptera and Coleoptera.** Spring term. Credit three hours. Given in alternate years. A continuation of course 131.] Not given in 1944–45.

134. **Taxonomy of the Holometabola: Lepidoptera and Hymenoptera.** Spring term. Credit three hours. Given in alternate years. A continuation of course 131. Prerequisite, courses 30 and 122; should be preceded by courses 15 and 131. Lecture, W 10. Laboratory, T Th 1.40–4. Comstock 300. Professor BRADLEY, Doctor FORBES, and Mr. PATE.

Lectures on the classification, comparative morphology, and the bionomics of the Lepidoptera and Hymenoptera; a laboratory study of the taxonomic literature and of the classification and characters of representative genera and species of these orders. Laboratory fee, $3.

ECONOMIC ENTOMOLOGY

41. **General Economic Entomology.** Spring term. Credit three hours. Prerequisite, course 12 or Zoology 1. Juniors and seniors may be admitted without prerequisites with the permission of the professor in charge. Lectures, W F 9. Comstock 145. Professor READIO. Practical exercises, T or Th 1.40–4. Comstock 100. Professor READIO and assistants.

Lectures on the life histories and habits of injurious insects, and on the methods of control; practical exercises on the commoner pests and the more important insecticides, as time permits; several field excursions. Laboratory fee, $3.

241. **Advanced Economic Entomology.** Spring term. Credit three hours. Open to qualified seniors and graduate students. Prerequisite, course 41. Lecture, M 11. Comstock 145. Laboratory, F 1.40–4 and S 8–10.30. Professor READIO.

A course for the student intending to work in the field of economic entomology. The lectures consist of discussions of the principles and methods of insect control; the laboratories consist of practical exercises in the use of materials and methods of insect control in the orchard, vegetable garden, and greenhouse.

43. **Insects Injurious to Trees and Shrubs.** Fall term. Credit two hours. Prerequisite, course 12. Lecture, S 9. Comstock 145. Laboratory, S 10–12.30. Comstock 100. Professor READIO.

A consideration of the chief insects injurious to shade trees, to trees of the farm woodlot, and to ornamental shrubs. Methods of control are stressed. Laboratory fee, $1.50.

PARASITOLOGY AND MEDICAL ENTOMOLOGY

Courses 51 and 52 are of particular value to those students who expect to be called into active service in the Armed Forces.

51. **Parasites and Parasitism.** Spring term. Credit two hours. Prerequisite, Biology 1 or Zoology 1. Lecture, T 9. Comstock 245. Laboratory, T or W 1.40–4. Comstock 200. Professor MATHESON.

A consideration of the origin and biological significance of parasitism, and of the structure, life, and economic relations of representative parasites. Laboratory fee, $2.

[52. **Medical Entomology.** Spring term. Credit two hours. Prerequisite, Zoology 1 or Biology 1. Professor MATHESON.] Not given in 1944–45.

This course deals with insects and other arthropods that are the causative agents of disease in man and animals, or are the vectors, or intermediate hosts, of disease-producing organisms. Laboratory fee, $2.

APICULTURE

Advanced and graduate students taking courses 122 and 124, and specializing in apiculture, are permitted to use the honeybee as illustrative material in the laboratory work of these courses.

61. **General Beekeeping.** Spring term. Credit three hours. Lectures, T Th 11. Comstock 17. Practical exercises, W 1.40–4. Comstock 17. Professor PHILLIPS.

This course is intended to afford a general knowledge of the fundamentals of beekeeping, including the life history, instincts, and general behavior of bees, their products, the sources of honey, the rôle of bees in cross-pollination, the equipment of the apiary, wintering problems, the diseases of bees, and the rearing of queens. Laboratory fee, $2.50.

261. **Advanced Beekeeping.** Fall and spring terms. Credit four hours a term. Open only to qualified seniors and graduate students. M F 11–12.50. Comstock 17. Professor PHILLIPS.

A technical course covering investigations, especially those of a scientific character, in all phases of apiculture. Special consideration is given to the study of beekeeping regions, with particular reference to conditions in New York.

Designed for advanced students preparing to teach or to do research in apiculture.

LIMNOLOGY AND FISHERIES

The courses offered in this division require a certain background in other subjects. Undergraduate students intending to do graduate work in the division should plan their studies from the first year with the following sequence of courses. First year, Zoology 1; second year, Botany 1, Zoology 8 and 16, and Entomology 12; third year, Entomology 32, 171, 173, and 174; fourth year, Botany 115. Students are also urged to obtain a foundation in statistics. Zoology 22 is recommended before graduation.

171. **Limnology.** Spring term. Credit three hours. Prerequisite, permission to register. Lecture, Th 11. Comstock 145. Laboratory, F 1.40–4, S one period by appointment. Comstock 110. Doctor WEBSTER.

An introduction to the study of the relations between aquatic organisms and their environment. A laboratory and field course. Laboratory fee, $5.

[172. **Advanced Limnology.** Fall term. Credit three hours. Prerequisite, permission to register.] Not given in 1944–45.

A qualitative and quantitative treatment of the problem of the productivity of inland waters. Laboratory fee, $7.50.

[173. **Fishery Biology.** Fall term. Credit three or four hours. Prerequisite, permission to register. Doctor WEBSTER.] Not given in 1944–45.

The lectures deal with the life history of the more important species of food and game fishes in order to provide an understanding of the factors of fish production. Several ocean and freshwater species are studied intensively. Such subjects as spawning, food and feeding habits, enemies and diseases, migration, growth, age determination, methods of capture, and economic value are discussed. The laboratory period is limited to those specializing in wildlife management and deals with the methods of studying life histories as employed by modern fishery investigators. Laboratory fee, $2.

[174. **Fish Culture.** Spring term. Credit three hours. Must be preceded by course 173.] Not given in 1944–45.

A study of the production of fish in hatcheries to meet the specifications of fisheries-management programs. The course includes the problems of hatchery construction and design, the care, handling, and feeding of fish, the treatment of diseases, and the cost of production. The students participate in field and hatchery work. Laboratory fee, $7.

Insect Physiology

[185. **Insect Physiology.** Fall term. Credit four hours. Prerequisite, course 122, Chemistry 102 or 104, and Physics 3 and 4. Doctor Patton.] Not given in 1944–45.

An introductory course for upperclassmen and graduate students. The physiology of insect systems is discussed and demonstrated by a series of laboratory exercies. Fee, $2.50.

Research

300. **Research.** Fall and spring terms. Credit and laboratory fees to be arranged. Prerequisite, permission to register from the professor under whom the work is to be taken. Comstock.

300a. **Insect Ecology.** Professor Palm.

300b. **Insect Morphology, Histology, and Embryology.** Doctor Butt.

300c. **Taxonomy.** Professor Bradley (all orders), Professor Matheson (insects of medical importance), Doctor Forbes (Lepidoptera), and Associate Professor Hood (Thysanoptera).

300d. **Economic Entomology.** Professors Matheson, Readio, and Palm; Associate Professor Schwardt; Extension Associate Professor Leiby; Assistant Professors Rawlins and Watkins.

300e. **Medical Entomology and Parasitology.** Professor Matheson.

300f. **Apiculture.** Professor Phillips.

[300g. **Limnology and Fisheries.**] Not given in 1944–45.

[300h. **Insect Physiology.** Doctor Patton.] Not given in 1944–45.

300i. **Insect Toxicology.** Assistant Professor Norton.

Seminar

Jugatae. Fall and spring terms. M 4.15–5.15. Comstock 145.

The work of an entomological seminar is conducted by the Jugatae, and entomological club that meets for a discussion of the results of investigations by its members.

EXTENSION TEACHING

1. **Oral and Written Expression.** Throughout the year. Credit three hours a term. Open only to freshmen who are not taking English 2. Lectures and practice: fall term, M 11, T Th 10; spring term: M W F 11, Roberts 131. Criticism, by appointment, daily 8–4 and S 8–1. Professor Peabody and Mr. ———.

Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technic of public speech. Designed to encourage interest in public affairs, and, through demonstrations and the use of graphic materials and other forms, to train for effective self-expression in public. Special training is given to competitors for the Eastman Prizes for Public Speaking and the Rice Debate Stage. In addition, some study is made of representative work in English literature. Part of the work in the second term is a study of parliamentary practice.

101. **Oral and Written Expression.** Fall or spring term. Credit two hours. Open to juniors and seniors. The number in each section is limited to twenty students. Students should consult Professor PEABODY for assignment to sections. Lectures and practice: fall term, T Th 9, T Th 11, or W F 10, Roberts 131; spring term, T Th 9, or T Th 11, Roberts 131. Criticism, by appointment, daily, 8–4, S 8–1. Professor PEABODY and Mr. ————.

Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technic of public speech. Designed to encourage interest in public affairs, and, through demonstrations and the use of graphic material and other forms, to train for effective self-expression in public. Special training is given to competitors for the Eastman Prizes for Public Speaking and in the Rice Debate contest. (See page 86.)

102. **Oral and Written Expression.** Spring term. Credit two hours. Prerequisite, course 101, of which course 102 is a continuation. A part of the work of course 102 consists of a study of parliamentary practice. Lectures and practice, W F 10, or T Th 10. Roberts 131. Criticism, by appointment, daily 8–4, S 8–1. Professor PEABODY and Mr. ————.

103. **Extension Organization, Administration, and Policy.** Spring term. Credit three hours. Open to graduate students and seniors, and to juniors by special arrangement. Lectures and exercises based on field work. M W F 10. Roberts 492. Professors SIMONS, HOEFER, MORRIS, EDDY, and other members of the Extension Staff.

This course is designed to familiarize students with the organization, administration, methods, and policies of extension work as exemplified in New York State. The course is for students preparing for effective service as citizens in rural communities, as well as for prospective county agricultural agents, county 4-H Club agents, home-demonstration agents, or other extension workers in agriculture and home economics. Fee for materials furnished, 50 cents.

[104. **Advanced Oral Expression.** Spring term. Credit two hours. Prerequisite, courses 101 and 102. Limited to nine students. Professor PEABODY.] Not given in 1944–45.

An advanced course of study and practice in oral expression as directly related to the needs of the county agricultural agent, the home demonstration agent, the 4-H club leader, and the extension specialist. Part of the work consists in a study of and practice in radio speaking.

[110. **Agricultural Radio Broadcasting.** Spring term. Credit two hours. Prerequisite, course 101, or its equivalent, and an average grade of at least 80 in English. Professor TAYLOR and Associate Professor PHILLIPS.] Not given in 1944–45.

A course to familiarize students with the best methods of presenting ideas by radio and with radio-studio procedure. Practice includes auditions and criticisms for all members of the class in preparing and presenting radio talks; continuity writing and program arrangements. Participation in broadcast programs from the University station is required. Fee for materials furnished, $1.

15. **Elements of Journalism.** Fall term. Credit three hours. T Th S 10. Roberts 392. Professor ————.

The principles of news writing as applied to agricultural and home-economics subjects.

117. **Agricultural News Writing.** Fall and spring terms. Credit two hours a term. Prerequisite, course 15. Th 2–4. Roberts 492. Professor ————.

Practical news writing for publication; includes criticisms, discussions, and consultations on published material written by students in the course.

119. **The Country Newspaper.** Fall term. Credit two hours. Prerequisite, course 15. M W 10. Roberts 492. Professor ————.

A study of the community newspaper, its problems, its make-up, and its place as an influence in rural life.

120. **Publicity and Advertising.** Spring term. Credit two hours. Prerequisite, course 15. T Th 11. Roberts 392. Professor ————.

Publicity and advertising in agricultural extension.

122. **Special Feature Articles.** Spring term. Credit two hours. Prerequisite, course 15. M W 11. Roberts 492. Professor ————.

124. **Extension Graphics.** Spring term. Credit two hours. Prerequisite, course 15. Lecture, M 12. Laboratory, M 1.40–4. Roberts 392. Professor ———— and Mrs. THOMAS.

The making of designs, posters, charts, and exhibits for illustration and display in connection with extension work.

FARM PRACTICE

The farm-practice requirement is 40 points, all of which must be obtained by actual farm work. (See page 21.)

The Office of Farm Practice will assist students in getting work on farms during vacations and at other times, and will supervise and keep records of the work.

Students should consult the office in regard to work on farms.

The office will also be glad to assist those students who have completed the farm-practice requirement, in obtaining places on farms where they can gain wider experience.

1. **Farm Practice.** Fall and spring terms. Without credit toward graduation, but giving credit toward the farm-practice requirement, depending on the amount and the quality of the work done. Hour and place, by appointment. Professor KING and assistants.

A course designed to assist those students who enter with little or no farm experience. Students will have an opportunity to hitch, harness, and drive horses and to familiarize themselves with the use of the common farm tools. Admission to this course will be determined by the results of the farm-practice tests. This course should be taken by all new students who have had limited farm experience.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

Instruction in the Department of Floriculture and Ornamental Horticulture is planned for students with the following interests: (1) commercial plant production, distribution, or utilization, including the management of greenhouses, nurseries, and wholesale and retail establishments; (2) developing a landscape service, including the planning, construction, and planting of small properties (these students are expected to register for one summer session); (3) superintendence of parks or of private estates; (4) general information on home flower gardening.

Courses 1, 2, 10, 12, 13, 115, and 123 are required of all students majoring in the Department. These students must also satisfy the department practice requirement based on experience with ornamental plants and their culture.

GENERAL COURSES

1. **General Floriculture and Ornamental Horticulture.** Fall term. Credit three hours. Lectures, M W 10. Plant Science 37. Laboratory, T or Th 1.40–4. Plant Science 15. Associate Professor POST.

An elementary course covering the principles and practices of growing ornamental plants in the garden, greenhouse, and home. Laboratory fee, $4; deposit, $2.

2. **Introduction to Landscape Design.** Spring term. Credit three hours. Lectures, M W F 9. Plant Science 37. Associate Professor PORTER.

A consideration of the principles of landscape design as applied to the small-residence property.

[5. **Flower Arrangement.** Spring term. Credit two hours. Mr. ————.] Not given in 1944–45.

A study of the principles and methods of arranging flowers and other plant materials for decorative use. Laboratory fee, $8; deposit, $2.

Plant Materials and Propagation

[10. **Taxonomy of Cultivated Plants.** Fall term. Credit three hours. Intended primarily for students majoring in floriculture. Prerequisite, Botany 1 or its equivalent. Professor ————.] Not given in 1944–45.

A study of the kinds of cultivated ferns and seed plants and their classification into genera and families. Emphasis is placed on methods of identification, the preparation and use of analytical keys, the distinguishing characteristics of the families concerned and their importance in ornamental horticulture. Laboratory fee, $3.

[12. **Herbaceous Plant Materials.** Spring term. Credit three hours. Prerequisite, course 10 or permission to register. Assistant Professor Allen.] Not given in 1944–45.

A study of the ornamental herbaceous plants used in landscape and garden plantings. Emphasis is placed on the identification, use, and culture of spring-flowering bulbs and perennials. The class visits Rochester parks and gardens in late May. Laboratory and transportation fee, $7.

[112. **Herbaceous Plant Materials, Advanced Course.** Fall term. Credit one hour. Prerequisite, course 12. Assistant Professor Allen.] Not given in 1944–45.

A continuation of course 12 dealing with annuals and late-summer and fall-flowering perennials. The arrangement and the use of herbaceous plants in the garden are studied. Laboratory fee, $2.

13. **Woody-Plant Materials.** Spring term. Credit four hours. Prerequisite, course 10 or permission to register. Lectures, T Th 9. Plant Science 37. Laboratory and field trips, M and W or F 1.40–4. Plant Science 29. Professor R. W. Curtis.

A study of the trees, shrubs, and vines used in landscape planting. Emphasis is placed on their characteristics and value for use as landscape material. The class will visit Rochester parks and gardens. Laboratory and transportation fee, $7.

100. **Military Camouflage.** Fall or spring term. Credit two hours. Lectures and demonstrations, Th 8. Room 37, Plant Science. Laboratory, M or T 1.40–5. Room 29, Plant Science. Assistant Professor Pridham and Associate Professor Porter.

A course designed to acquaint the student with the principles of camouflage as they apply to military activity and installations. Intended primarily for those about to enter Military Service. Interpretation of aerial photographs, reconnaissance, and map reading are used in solution of typical problems. Laboratory work includes planning, discipline, and erection of camouflage for typical installations and operations. Laboratory fee, $1.50.

[113. **Woody-Plant Materials, Advanced Course.** Fall term. Credit two hours. Prerequisite, course 13. Professor R. W. Curtis.] Not given in 1944–45.

A continuation of course 13 for students in the landscape nursery service. An opportunity for the more intimate study of important groups of ornamental plants, particularly their adaptability to landscape use. A trip is taken to the Rochester parks. Laboratory and transportation fee, $7.

[114. **Turf.** Spring term. Credit two hours. Prerequisite, Agronomy 1 and permission to register.] Not given in 1944–45.

A course dealing chiefly with the principles, practices, and materials for the construction and maintenance of lawn areas. Some attention is given sports turf. A week-end inspection trip is taken to experimental test plots and special turf areas. Laboratory and transportation fee, $12.

115. **Plant Propagation.** Fall term. Credit three hours. Prerequisite, courses 12 and 13 and Botany 31 or their equivalent. Lectures, T Th 11. Plant Science 37. Laboratory, S 10.30–12.50. Greenhouses.

A study of the principles and methods involved in the propagation of woody and herbaceous plants by seeds, division, layers, cuttings, budding, and grafting. The class visits nurseries at Geneva and Newark, New York. Laboratory and transportation fee, $5.

[119. **Outdoor Culture of Ornamental Plants.** Spring term. Credit three hours. Prerequisite, courses 12, 13, and 115 and Botany 31. Assistant Professor PRIDHAM.] Not given in 1944–45.

A study of the principles and practices employed in the maintenance of landscape materials in the garden and in the production of plants in the nursery. Soil relationships, fertilizing, pruning, winter protection, and other problems are considered. A trip to observe estates and nurseries is taken. Laboratory and transportation fee, $10.

COMMERCIAL FLORICULTURE

[123. **Florist Crop Production.** Fall term. Credit four hours. Prerequisites, course 115, Botany 31, Agronomy 1, and the practice requirement. Associate Professor POST and Mr. ————.] Not given in 1944–45.

A comprehensive study of the application of basic science to the culture of ornamental plants, particularly under greenhouse conditions. A trip is taken to greenhouses in Rome and Utica, New York. Laboratory and transportation fee, $7.

[124. **Commercial Greenhouse Production.** Spring term. Credit three hours. Prerequisite, course 123. Associate Professor POST and Mr. ————.] Not given in 1944–45.

A course supplementary to course 123 dealing with the commercial production of florists crops, emphasis is upon the practical problems concerned. A trip is made to nearby commercial greenhouse. Laboratory and transportation fee, $2.

[125. **Flower-Store Management.** Spring term. Credit two hours. Prerequisite, course 5 and permission to register. Associate Professor POST.] Not given in 1944–45.

Flower-shop management, business methods, and the making of floral designs are studied. Laboratory fee, $10; deposit, $2.

LANDSCAPE SERVICE

32. **Elementary Design and Planting of Small Properties.** Fall term. Credit three hours. Open to general election. Prerequisite, course 2 and Drawing 10. Lecture, F 9. Plant Science 22. Laboratory, M 1.40–5, and three additional hours. Plant Science 433. Associate Professor PORTER and Mr. BAIRD.

The application of the principles of design to the specific problems of the small-residence property. Laboratory fee, $5.

132. **Landscape Planning and Planting of Small Properties.** Fall and Spring terms. Credit four hours a term. Intended for advanced students. Not open for general election. Prerequisite, courses 12, 13, and 32, and Drawing 10 and 15. Lecture, T 10. Plant Science 141. Laboratory, T Th 1.40–5, and three additional hours. Plant Science 433. Associate Professor PORTER and Mr. BAIRD.

A study of the design and planting of small properties. Laboratory fee, $5 a term.

134. **The Construction and Planting of Small Gardens.** Fall term. Credit two hours. Intended for advanced students specializing in landscape service. Prerequisite, fall term of course 132. Lecture, Th 9. Plant Science 336. Laboratory, Th 10–12.50 and 1.40–5. Plant Science 433. Associate Professor PORTER. Laboratory fee, $3.

Seminar

241. **Seminar.** For department staff and graduate students. Fall and spring terms. Time to be arranged.

FORESTRY

Courses offered in forestry are designed to meet the needs of the following: (1) students in agriculture who wish instruction in the care and management of farm woodlands, and in the reforestation of non-productive farm lands; (2) students preparing for the field of wildlife conservation and management; (3) students preparing for the fields of agricultural extension or the teaching of vocational agriculture; (4) students who wish an understanding of the status and problems of natural-resource conservation. Instruction in professional forestry is not offered at Cornell.

1. **Farm Forestry.** Fall term. Credit three hours. Lectures, M W 11. Fernow 122. Laboratory, M 1.40–4. Fernow 206. Professor Guise.

Techniques of forestry practice applicable to farm woodlands. The principal trees of New York State, their identification, ecological relationships, and uses; measurement of logs, trees, and stands; reforestation; treatment of second-growth stands, including thinnings and improvement cuttings; protection from grazing and fire; harvesting of timber and utilization of products, including preservative treatment of wood. Laboratory fee, $1.

3. **Conservation of Natural Resources.** Spring term. Credit two hours. Lectures, T Th 10. Fernow 122. Professor Guise.

The conservation of natural resources in the United States; the interrelation of the uses and wastes of the forest with those of various resources; the influence of the physical equipment of America on human life and on American civilization, with special reference to natural resources, as the basis of national strength.

23. **Establishment and Management of Farm Woodlands.** Spring term. Credit three hours. Lectures, M W 11. Fernow 206. Laboratory, M 1.40–4. Fernow 206. Professor Guise.

Identification, distribution, and importance of the principal timber trees and forest types of the Northeast; forest planting, including the production of trees in forest nurseries; care and treatment of both natural and planted stands; protection from injurious agencies; thinnings and improvement cuttings; harvesting of mature timber; sustained yield, woodland-management plans. Laboratory fee, $1.

[166. **Forestry in Relation to Wildlife Conservation.** Fall term. Credit two hours. Prerequisite, Wildlife Conservation and Game Management 2. Professor ————.] Not given in 1944–45.

A consideration of the place of wildlife conservation and management in the multiple-purpose programs which govern the full and rounded use of national, state, and private forests.

291. **Seminar.** Spring term. Without credit. Hours to be arranged. Members of the departmental staff.

METEOROLOGY

1. **Elementary Meteorology.** Fall or spring term. Credit three hours. Lectures, T Th 11. Plant Science 143. Laboratory, Th or F 1.40–4. Plant Science 114. Professor Mordoff and assistants.

A course designed to acquaint the student with the principles of the general and secondary circulation of the atmosphere; the elements of weather and climate; practical weather forecasting from weather maps and local observations. Laboratory fee, $2.

2. **General Climatology.** Fall term. Credit two hours. Prerequisite, course 1. Lectures and recitations, M W 9. Plant Science 114. One conference period a week, by appointment. Professor MORDOFF.

A course designed to give a general knowledge of climatology and of the various climates of the United States, with emphasis on those of New York State.

211. **Research.** Fall or spring term. Credit one or more hours a term. Prerequisite, permission to register. Hours by appointment. Professor MORDOFF.

A course designed for advanced and graduate students. Original investigations in meteorology and climatology.

212. **Seminar.** Spring term. Credit two hours. Prerequisite, course 2 and permission to register. Hours to be arranged. Plant Science 114. Professor MORDOFF.

Preparation and reading of reports on special topics; abstracts and discussions of papers dealing with the current literature of meteorology and climatology. A specific problem is required of each student.

PLANT BREEDING

101. **Genetics.** Fall term. Credit four hours. Prerequisite, a beginning course in a biological science. Courses in cytology and in taxonomic botany and zoology will be found helpful. Not open to sophomores. Lectures, M W F 8. Plant Science 233. One conference period, to be arranged. Laboratory, M T or F 1.40–4. Plant Science 146. Assistant Professor CUSHING and Miss MORRIS.

A course designed to acquaint the student with the fundamental principles of heredity and variation in plants and animals.

Laboratory studies of hybrid material in plants and breeding experiments with the vinegar fly, Drosophila. Laboratory fee, $3; deposit, $2.

201. **Genetics, Advanced Course.** Spring term. Credit three hours. Seniors admitted by special permission. Discussions, M F 8–10, and laboratory work to be arranged. Plant Science 146. Assistant Professor CUSHING and Miss MORRIS. Laboratory fee, $3; deposit, $2.

103. **Plant Breeding.** Fall term. Credit three hours. (Students who have had course 101 will be allowed two-hours credit.) Prerequisite, Botany 1 and a general course in at least one of the following: farm crops, vegetable crops, floriculture, or pomology. Lectures, T Th 8. Plant Science 141. Lecture and practice, S 8–10. Plant Science 146. Associate Professor MUNGER.

A general study of the principles and practices of plant breeding, hybridization, selection, seed production and distribution in relation to crop improvement; development of methods for different types of plants; lectures supplemented by periods in the greenhouse and experimental fields. Laboratory fee, $3.

150. **Special Problems in Plant Breeding and Genetics.** Fall or spring term. Credit one or two hours. Open to properly qualified seniors. Prerequisite, Plant Breeding 101 or 103 and permission to register. Members of the Plant Breeding staff.

211. **Statistical Methods of Analysis.** Fall term. Credit two hours. For graduate students. Seniors admitted by special permission. Th 1.40–4. Plant Science 233. Associate Professor LIVERMORE.

A discussion of statistical methods for the study of variation, correlation, curve fitting, experimental error, the analysis of variance and of covariance; and the application of these methods to problems in biology and related fields. Laboratory fee, $2.

212. **Special Problems in Statistical Methods.** Spring term. Non-credit course. Limited to graduate students who have had course 211 or similar work. Hours to be arranged. Professor LOVE.

A conference course dealing with the problems of plot technic and related topics, such as the design of experiments and interpretation of results.

222. **Seminar.** Spring term. For graduate students only. W 11. Plant Science. Professors LOVE, BUSSELL, and WIGGANS, Associate Professors LIVERMORE and MUNGER, Assistant Professors CUSHING and ATWOOD, and Doctor DORSEY.

PLANT PATHOLOGY

1. **Elementary Plant Pathology.** Fall term. Credit three hours. Prerequisite, Botany 1 or its equivalent. For graduates and undergraduates. Lecture, Th 11. Plant Science 336. Practice and conferences, any two periods, T W Th F 1.40–4. Plant Science 336, 341, 343, and 362. Professors WHETZEL and WELCH.

An introductory course dealing with the nature, cause, and control of disease in plants. Some of the commoner diseases of cultivated crops are studied in the laboratory. Laboratory fee, $4.50; breakage deposit, $5.

2. **Principles of Plant-Disease Control.** Spring term. For graduates and undergraduates. Credit three hours. Prerequisite, course 200 or 1. Lecture, Th 8. Plant Science 336. Practice, T Th 1.40–4. Plant Science 342. Professor WHETZEL, Associate Professor L. J. TYLER, and assistant.

A consideration of the principles and methods of controlling plant diseases. This includes studies on: exclusion by laws, regulations, quarantine, inspection, and disinfection; eradication by pruning, seed selection, tree surgery, rotation, disinfection, and other means; protection by spraying, dusting, wound dressing and the like; immunization by selection, breeding, and feeding. Number taking the course limited to twenty-four. Laboratory fee, $4.50; breakage deposit, $5.

13. **Diseases of Plants.** Fall term. Credit three hours. Open to freshmen. Lectures, W F 10. Plant Science 336. Practice, F 1.40–4. Plant Science 341. Professor WELCH and members of the Plant Pathology Staff.

A course designed to introduce beginning students to the general field of plant pathology, including the importance of plant diseases to agriculture, the nature and causes of disease in plants, and the various methods employed in their control. Laboratory fee, $4.50; breakage deposit, $5.

111. **Diseases of Trees and Shrubs.** Spring term. Credit three hours. Prerequisite, course 1 or 200. Lecture, F 10. Plant Science 336. Laboratory, T Th 1.40–4. Plant Science 362. Professor WELCH.

A course dealing with the diseases peculiar to woody plants, their recognition and treatment. Laboratory fee, $4; breakage deposit, $3.

200. **General Plant Pathology.** Fall term. Credit four hours. For graduate students with their majors or minors in plant pathology. Open also to qualified graduate students in other fields. Prerequisite, permission to register. Lecture, T 11. Plant Science 336. Practice, three three-hour periods weekly at the students' convenience. Professors WHETZEL and WELCH and Associate Professor L. J. TYLER.

This course is designed to give the entering graduate student an introduction to the basic features and technics of the science of phytopathology and to provide an adequate foundation for successful prosecution of research in this field. Laboratory fee, $4.50; breakage deposit, $5.

201. **Advanced Plant Pathology.** Fall and spring terms. Credit three hours. Designed for students specializing in plant pathology. Prerequisite, courses 200 and 2 and permission to register. Lecture, T 9. Plant Science 336. Practice, T Th 10–12.30. Plant Science 304. Professor MASSEY and Mr. ————.

A presentation and analysis of the experimental and empirical knowledge of plant diseases. The phenomena of inoculation, infection, susceptibility, and suscept reactions are critically considered. Laboratory fee, $4.50; breakage deposit, $3.

[121. **Comparative Morphology of Fungi.** Spring term. Credit four hours. Given in alternate years. Prerequisite, Botany 1 or its equivalent, and permission to register. Professor FITZPATRICK.] Not given in 1944–45.

An introductory course in mycology. Emphasis is placed on morphology rather than on taxonomy.

221. **Mycology.** Fall and spring terms. Credit five hours. Given in alternate years. Prerequisite, Botany 1 or its equivalent and permission to register.

Lectures, M W 11. Plant Science 336. Practice, M W 1.40–4. Plant Science 329. Professor FITZPATRICK.

A more intensive course than the preceding, designed especially for students specializing in mycology or plant pathology. Emphasis is placed on morphology and taxonomy, but other aspects of mycology are embraced. Practice in identification of specimens is afforded in various groups, and field work in autumn and spring is encouraged. Laboratory fee, $6; breakage deposit, $3.

[222. **Advanced Mycology.** Fall term. Credit five hours. Given in alternate years. Prerequisite, course 221. Professor FITZPATRICK.] Not given in 1944–45.

This course is designed chiefly for students majoring in mycology or in mycological phases of plant pathology. It supplements course 221, gives additional training in taxonomy, and widens the student's horizon in the field as a whole. Emphasis is placed on field work, identification of specimens, herbarium practice, and library studies as a preliminary to research. Lectures deal chiefly with special topics.

231. **History of Plant Pathology.** Fall and spring terms. Credit one hour. Prerequisite, course 1 and a reading knowledge of French and German. Professor WHETZEL.

241. **Undergraduate Research.** Fall or spring term, or both. Credit three hours or more. Registration by permission. Not less than three laboratory periods of three clock hours each week. Professors and assistant professors of the departmental staff.

This course is designed to afford opportunity for selected undergraduates to test their inclination and ability to do research work. The student is expected to prosecute with interest and enthusiasm, under informal direction of the professor, some problem or problems mutually agreed upon. Laboratory fee, $1.50 a credit hour; breakage deposit, $3.

242. **Seminar.** Fall and spring terms. Required of graduate students taking work in the department. T 4.30–6. Plant Science Seminar Room.

243. **Literature Review.** Optional. Biweekly. Time to be arranged.

POMOLOGY

Students desiring to do their major work in pomology may obtain a suggested sequence of courses for the four-year period by consulting the Department.

1. **General Pomology.** Spring term. Credit three hours. Two-hours credit for those who have taken course 2. Should be preceded or accompanied by elementary courses in botany and chemistry. Lectures, T Th 8. Plant Science 143. Laboratory, M 1.40–4. Plant Science 107. Associate Professor SMOCK and Messrs. _____.

A study of the general principles and practices in pomology and their relation to the underlying sciences; propagation and care of orchard trees and small fruits; harvesting, storing, and marketing fruit; practical work in budding, grafting, pruning, and planting; study of varieties, growth, and fruiting habits. Laboratory fee, $1.50.

2. **Practices of Fruit Growers.** Fall term. Credit three hours. Lecture, Th 8. Laboratory, S 8–12. Plant Science 107. Associate Professor BOYNTON and _____.

This course is designed for students who intend to work on fruit farms, or to work with fruit growers during the war. Emphasis is placed on the practices that are used, and, when possible, the laboratories give the students actual experience with the operations carried out in commercial orchards. Attention is given to the problems of growing small fruits, and, in connection with orchard-fruit production, the practice of growing, harvesting, packing and storage, spraying, selection of orchard site, soil management, fruit varieties, pollination, thinning, grafting, and pruning.

[102. **Fruit Varieties.** Fall term. Credit two hours. Prerequisite, course 1. Professor ————.] Not given in 1944–45.

A systematic study of the most important varieties of apples, pears, peaches, plums, grapes, and small fruits from the standpoint of their identification, growth characters, regional adaptation, season of ripening, storage quality, utilization, and other matters of a similar nature. The breeding and testing of new varieties is considered. Laboratory fee, $1.50.

111. **Handling, Storage, and Utilization of Fruit.** Fall term. Credit three hours. Prerequisite, course 1. Lectures, T Th 8. Laboratory, M 1.40–4. Plant Science 107 and the packing house. Associate Professor SMOCK and Mr. ————.

The important factors in harvesting and handling fruit that affect quality and marketability are studied. Emphasis is placed on the practices and problems of handling apples, but the work covers also such fruits as peaches, pears, and grapes, in so far as these are available. The effect of grades and packages on distribution and marketing is fully discussed, with some attention to the problems of market inspection. Consideration is given to the principles and practices of common, cold, and modified air storage, and to the utilization of fruits in the dried, canned, frozen, or juice forms. Laboratory fee, $1.50.

112. **Advanced Laboratory Course.** Spring term. Credit two hours. S 8–1. Plant Science 107. Intended for students doing their major work in pomology. Associate Professors BOYNTON and SMOCK and Extension Professor HOFFMAN.

This course is designed to give more extended practice in the various orchard operations than can be given in course 1. Special attention is given to problems of pruning, tree surgery, bracing, orchard-soil selection and management, fruit judging, pollination, and spray practice.

[121. **Economic Fruits of the World.** Fall term. Credit three hours. Given in alternate years. Prerequisite, course 1. Professor ————.] Not given in 1944–45.

A study of all species of fruit-bearing plants of economic importance, such as the date, the banana, the citrus fruits, the nut-bearing trees, and the newly introduced fruits, with special reference to their cultural requirements in the United States and its insular possessions. All fruits not considered in other courses are considered here. The course is designed to give a broad view of world pomology and its relationship with the fruit industry of New York State. Laboratory fee, $1.50.

[131. **Advanced Pomology.** Spring term. Credit four hours. Given in alternate years. Prerequisite, courses 1 and 102 and Botany 31. Professor HEINICKE.] Not given in 1944–45.

A comprehensive study of the sources of knowledge and opinion as to practices in pomology. The results of experiences and research pertaining to pomology are discussed, with special reference to their application in the solution of problems in commercial fruit growing.

231. **Special Topics in Experimental Pomology.** Spring term. Credit three hours. Given in alternate years. Open to qualified seniors and to graduate students. Conference hours, to be arranged. Professor HEINICKE and Associate Professors BOYNTON and SMOCK.

In this course the student is expected to review critically and evaluate the more important original papers relating to various phases of pomological research. Interpretation of the literature is made on the basis of fundamental principles of plant biology. Recent experimental methods applicable to the field of pomology are fully considered.

[200. **Seminar.** Fall and spring terms. Without credit. Required of students taking course 201 of graduate students in pomology. Members of the departmental staff.] Not given in 1944–45.

201. **Research.** Fall, spring, or both terms. Credit two or more hours a term. Prerequisite, course 131. Professor HEINICKE, Extension Professor HOFFMAN, and Associate Professors SMOCK and BOYNTON.

POULTRY HUSBANDRY

Course 1 is a prerequisite for all other courses. Specially qualified students may have this prerequisite waived for some courses by permission of the instructors concerned.

1. **Farm Poultry.** Fall term. Credit three hours. Lectures, M W F 10. Rice 300. One recitation period, to be arranged. Rice 305. Professor HALL, assisted by other members of the staff.

A general course dealing with the practical application of the principles of poultry husbandry to general farm conditions.

110. **Poultry Nutrition.** Spring term. Credit three hours. Prerequisite, course 1. Not open to freshmen. Lectures, T Th 9. Laboratory, T 1.40–4. Rice 305. Professor HEUSER.

The principles of poultry nutrition and their application to poultry-feeding management.

210. **Experimental Methods in Poultry Nutrition.** Fall term. Credit two hours. For graduate students. Not given every year and not unless five or more students apply for the course. Registration by appointment. Discussion and laboratory period, W 1.40–5. Rice 201. Professor NORRIS.

A critical consideration of the domestic fowl as an experimental animal and of the experimental methods used in conducting research in poultry nutrition. Laboratory fee, $5.

219. **Seminar in Animal Nutrition.** Fall and spring terms. Credit one hour each term. Open to graduate students only. Registration by appointment. Assigned readings on selected topics, with weekly conferences. M. 4.15. Professors MAYNARD, NORRIS, and HAUCK and Acting Professor ADOLPH.

A consideration of the experimental data on which the principles of animal nutrition are based, and a critical review of current literature.

20. **Poultry Breeds, Breeding, and Judging.** Fall term. Credit three hours. Prerequisite, course 1. Lecture or recitation, M W 11. Rice 100. Laboratory, T 1.40–4. Judging Laboratory. Professor HALL.

Selecting and judging birds for production and breed characters; origin, history, and classification of breeds; introduction to breeding. A one-day trip is made to one of the leading poultry shows. Estimated cost for transportation, $5.

[120. **Poultry Genetics.** Spring term. Credit two hours. Given in alternate years. Open to graduate students, juniors, and seniors. Prerequisite, Zoology 1, Plant Breeding 101, and permission of the instructor. Professor HUTT.] Not given in 1944–45.

A survey of inherited characters in domestic birds, cytology, linkage, inbreeding, hybrid vigor, resistance to disease, and the application of genetic principles to poultry breeding.

[121. **Physiology of Avian Reproduction.** Spring term. Credit two hours. Given in alternate years. Open to graduate students, juniors, and seniors. Prerequisite, permission of the instructor. Professor ————.] Not given in 1944–45.

Gross and microscopic anatomy of the reproductive organs of birds and their functions, with special reference to the fowl. A study of the formation of eggs and spermatozoa, causes of infertility and embryonic mortality, the functions of the endocrine glands, and the influence of environment upon fecundity.

220. **Animal Genetics.** Fall term. For graduate students. Prerequisite, Plant Breeding 101 and permission of the instructor. Not given every year and only if four or more students register. Professor HUTT.

Assigned readings and conferences on inbreeding; hybridization; disease resistance; lethal genes; genetic sterility; sex; heredity in laboratory animals, domestic animals, and man; sire indices and other topics. Designed to acquaint the student with the literature and methods of research in animal genetics.

[229. **Seminar in Animal Breeding.** Fall and spring terms. Professors HUTT and ASDELL.] Not given in 1944–45.
Discussion of current literature and special topics of interest to workers in this field.

30. **Incubation and Brooding.** Spring term. Credit three hours. Prerequisite, course 1. Lectures, T Th 11. Laboratory, Th 1.40–4. Rice 100. Professor BRUCKNER.
Principles and practice of incubation and brooding of domestic and game birds; problems of hatchery management.

[140. **Anatomy of the Fowl.** Fall term. Credit two hours. Prerequisite, course 1 and permission of the instructor. Assistant Professor ————.] Not given in 1944–45.
The lectures, supplemented by laboratory periods for study and dissection, are designed to acquaint the student with the anatomy of the fowl. Laboratory fee, $2.

50. **Market Eggs and Poultry.** Spring term. Credit two hours. Prerequisite, course 1. Lecture, M 10. Laboratory, T 1.40–4. Rice 100. Professor HALL.
A detailed study of the interior and exterior qualities of eggs, abnormalities, egg grades, and standards; practice in candling, grading, and packing. Grades and standards of market poultry; killing, dressing, and packing. General market information. Laboratory fee, $2.

170. **Poultry Hygiene and Disease.** Fall term. Credit two hours. Prerequisite, Bacteriology 1 or 3. Lecture and laboratory, Th 1.40–4. Moore Hall. Doctor HOFSTAD.
The course deals with the nature of the infectious and parasitic diseases of poultry and with the principles of hygiene applicable to poultry farming for the prevention and control of diseases.

190. **Poultry Problems.** Fall or spring term. Credit, one, two, or three hours. Open to juniors or seniors. Prerequisite, permission of staff member concerned. Investigation of some problem in the field of poultry husbandry by the student under the direction of a member of the staff.

209. **Seminar in Poultry Biology.** Fall and spring terms. For graduate students. F 4. Rice 201. Members of the departmental staff.
A survey of recent literature and research in poultry biology.

RURAL EDUCATION

FIVE-YEAR PROGRAM FOR THE PREPARATION OF SECONDARY-SCHOOL TEACHERS

This program is recommended for all prospective teachers of secondary-school subjects. It is required of all prospective teachers of academic subjects who prepare at Cornell University to enter teaching in New York State after December 31, 1942. The general pattern follows:

Pre-professional studies

Freshman Year
Social Science A and B..... 6 hours
(Freshman or Sophomore Year)

Sophomore Year
Human Growth and Development..... 6 hours
First selection of prospective teachers

Professional studies

Junior Year
- 100. Educational Psychology ..... 3 hours
- 120. Social Foundations of Education..... 3 hours

Second selection of prospective teachers

Senior Year
- The Art of Teaching..... 10 hours
  - Academic subjects, Course 130
  - Vocational Agriculture, Courses 131 and 132
  - Home Economics, Course 130b

Final selection of prospective teachers

Fifth year
- 200. Apprentice teaching ..... 6 hours
- 210. Special Problem in Teaching..... 2 hours
- 220. Philosophy of Education..... 2 hours

(The first four years of this sequence satisfy the present requirements for certification in vocational agriculture and home economics.)

The remainder of the student's program will be made up of: (1) courses required by the college in which the student is registered; (2) courses in the field or fields in which he plans to teach; (3) courses helpful in developing understandings and appreciations of particular significance to teachers.

The details regarding the five-year program may be found in the Announcement of the School of Education.

Psychology and Educational Psychology

100. **Educational Psychology.** Fall or spring term. Credit three hours. Prerequisite, Human Growth and Development. Not open to freshmen.

Students should register for the course number which corresponds to the section they take, as follows:

Fall term:
- 100a. Lectures, M W F 8. Plant Science 141. Dr. Woodruff.
- *100b. Lectures, M W F 11. Goldwin Smith 236. Professor Freeman.

Spring term:
- 100a. Lectures, M W F 9. Warren 125. Dr. Woodruff.
- *100b. Lectures, M W F 11. Mrs. Riemer.

Consideration of the outstanding facts and principles of psychology bearing upon the problems of education.

110. **Psychology: An Introductory Course.** Fall or spring term. Credit three hours. Not open to freshmen. M W F 10. Goldwin Smith C. Professor Winsor.
Fee, $1.

112. **Psychology for Students of Education.** Fall or spring term. Credit three hours. Prerequisite, course 110, Psychology 1, Human Growth and Development, or the equivalent. Open to second-term sophomores, juniors, and seniors. Fall term, M W F 9. Spring term, M W F 10. Warren 125. Professor Kruse and Assistant Professor Bayne.
Fee, $1.

***Psychology for Students of Hotel Administration (Hotel Administration 114).** Fall term. Credit three hours. Not open to freshmen. Lectures, M W F 8. Warren 225. Professor Winsor.
A study of the methods and problems of general psychology.

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*Does not count as an agricultural elective for students in the College of Agriculture.

117. **Psychology of Childhood and Adolescence.** Fall or spring term. Credit three hours. Prerequisite, a course in educational psychology. M W F 10. Roberts 392. Dr. WOODRUFF.
Fee, $1.

*__Personnel Administration (Hotel Administration 119.)__ Spring term. Credit three hours. Prerequisite, Hotel Administration 114 or course 110. Lectures, M W F 8. Plant Science 233. Professor WINSOR.
A study of the problems of human relations in industry. The methods and principles of recruitment, selection, placement, maintenance, organization, and government of employees are analyzed with particular reference to industry and business.

211a. **Psychology for Students of Education.** Fall term. Credit three hours. For mature students with teaching experience. M F 11–12.20. Stone 309. Professor KRUSE.

212. **Psychology of Learning.** Spring term. Credit two hours. Th 4–5.15. Stone 309. Professor KRUSE.

[213. **Psychology of Learning in the School Subjects.** Fall term. Credit two hours. Assistant Professor BAYNE.] Not given in 1944–45.

[218. **Seminar in Educational Psychology.** Spring term. Credit two hours. Professor KRUSE.] Not given in 1944–45.

*__Seminar in Personnel Administration (Hotel Administration 219).__ Spring term. Credit two hours. Open to qualified seniors and graduate students. Th 4.15–6. Warren 340. Professor WINSOR.

METHOD

121. **Method and Procedure in Secondary School Teaching.** Fall term. Credit three hours. Prerequisite, course 100, 112, or the equivalent. Open to juniors and seniors. Lectures, M W F 11. Plant Science 37. Professor FERRISS.
The development of certain principles of teaching in secondary schools, and their applications to practical problems of teaching, such as objectives, selecting and organizing teaching materials, making the assignment, directing study, and so forth.

127. **Visual and Auditory Aids in Teaching.** Spring term. Credit two hours. Lecture, Th 1.40–2.30; laboratory, Th 2.30–5. Fernow 8. Assistant Professor JOHNSON.
A study of methods for preparing visual and other aids to instruction, together with a study of techniques for using such aids effectively.

†130. **The Art of Teaching.** (Ed. and R.E.) Fall and spring terms. Credit five hours a term. Prerequisite, Educational Psychology and Social Foundations of Education. Open only to selected seniors preparing to teach academic subjects. Associate Professor HULSE, Professor H. R. ANDERSON, Assistant Professor JOHNSON, Doctor GROMMON or Miss WELCH, and assistants. Fall term, T Th 11. Spring term, M 4. Goldwin Smith 227. Joint meeting with students of agriculture and home economics, first term, alternate Wednesdays, 4.15–5.30, 4–5.40. Other hours to be arranged.
In the fall term primary emphasis is placed on general method and observation, special method and observation of demonstration teaching, materials and course of study making, and participation in teaching secondary-school classes. The spring term is devoted mainly to responsible student teaching, conference, extra-instructional problems, and parallel experiences, and special preparation for apprentice teaching.
Distribution of credit: General Method and Extra-Instructional Problems, three hours; Special Method, three hours; Observation and Participation, one hour (25 clock hours); Student Teaching, three hours (75 clock hours).

*Does not count as an agricultural elective for students in the College of Agriculture.
†The five-hours credit in the fall term is counted toward the requirement in agricultural electives for students of the College of Agriculture; credit in the spring term is charged to the 20-hour allowance in free electives.

130b. **The Art of Teaching.** Fall and spring terms. To be taken in two successive terms. Credit two hours the first term the student is registered, and eight hours the second term the student is registered. Open to juniors and seniors who are preparing to teach home economics in the public schools. Professor BINZEL, Associate Professor HUTCHINS, Miss HASTIE, Mrs. ELLIOTT, and cooperating teachers.

Field work, one-half day each week and general conference, S 9–11 during the first term the student is registered in this course. Martha Van Rensselaer 121. Directed teaching for eight weeks, and general conference, S 10–1 throughout the second term of such registration. Martha Van Rensselaer 121. During the second term, the student registers for only one other course, Home Economics 300, Homemaking Apartments. Students live in the apartments for eight weeks and in the communities in which they teach for eight weeks.

Fee, including transportation, $4 the first term the student is registered and $11 the second.

31. **Planning for the Teaching of Agriculture.** Fall term. Without credit. Open to sophomores who are planning to teach agriculture in the public schools. Th 10, Warren 140. Associate Professor W. A. SMITH.

Consideration of the problems leading to the choice of agricultural education as a field of preparation.

131. **Introduction to Teaching in Vocational Agriculture.** Spring term. credit three hours. Must be preceded or accompanied by an approved course in educational psychology. Open by permission only to students whose practical experience and grades are satisfactory and whose progress in the prescribed courses in technical agriculture is adequate. Lectures, T Th 11. Laboratory, M 1.40–4. Plant Science 37. Associate Professor W. A. SMITH.

Consideration of the organization of programs of instruction in vocational agriculture and of the problems involved in conducting a program. Observation of teaching in typical departments; preparation for course 132. Laboratory fee, $3.

132a. **The Teaching of Agriculture in the Secondary School.** Fall and spring terms. Credit four hours during the fall term; three hours during the spring term. Open to juniors and seniors who have completed an approved course in educational psychology and course 131, whose farm experience is adequate, and who have permission to register. T Th 9. Warren 201. Laboratories, to be arranged. Associate Professor HOSKINS.

Joint meetings are held with students of home-economics and academic subjects in the fall term on alternate Wednesdays, 4–5.40.

The problems of teaching based upon the planning for and participation in teaching. Opportunity for experience is provided through organizing course materials, listing appropriate equipment for departments, and through planning programs for special groups. Laboratory fee, $5 a term.

[132b. **The Teaching of Agriculture in the Secondary School.** Fall and spring terms. Credit three hours. Associate Professor OLNEY.] Not given in 1944–45.

133. **Directed Teaching of Students in Agricultural Education.** Fall or spring term. Credit to be arranged. Registration by permission. Staff in Agricultural Education.

[134. **Adult Education.** Fall term. Credit three hours. Professor MOORE.] Not given in 1944–45.

[134a. **Special Education for Out-of-School Youths and Adults.** Spring term. Credit two hours. Associate Professor HOSKINS.] Not given in 1944–45.

134b. **Adult Homemaking Education: Organization and Policies.** Spring term. Credit three hours. Should precede course 134c. Discussions, M W F 11. Field trips and individual conferences to be arranged. Martha Van Rensselaer 3M13. Miss ————.

A professional training course for home-economics extension workers and public-school teachers of homemaking for adults; adapted to the needs of public

health and social workers and all of those interested in informal homemaking education. Estimated cost of trips, $8. Fee, $5.

134c. **Adult Homemaking Education: Program Planning and Methods.** Fall and spring terms. Credit two or three hours. Open to students who have had course 134b or comparable experience. Discussions, S 11.30–1. Field trips and individual conferences to be arranged. Martha Van Rensselaer 124. Miss ———.

An opportunity is provided for students to work independently on planning and carrying through, with a community group, a program of homemaking improvement. Estimated expenses for field work, from $2 to $5. Fee for three hours, $5.

200. **Apprentice Teaching.** An eight-week period off-campus to be arranged. Credit six hours. Required of all candidates for the degree of master of education. Prerequisite, satisfactory completion of the first four years of the five-year program, or the equivalent, or special permission. Members of the staff.

Students are assigned to cooperating schools so selected as to provide the most favorable conditions for this type of experience. They are expected to carry a half-time teaching program, including the usual related responsibilities of the teacher. Preparation for teaching and work on special problems under the direction of University instructors occupies the remainder of the student's time. Each student is under the immediate supervision of the principal, of a competent local teacher, and of a member of the staff of the School of Education.

210. **Special Problem in Teaching.** Fall or spring term. Credit two hours. Members of the staff.

A critical study of some phase of teaching undertaken during the period of apprentice teaching.

226. **Research in Science Teaching.** Fall or spring term. Credit one or two hours a term. Hours to be arranged. Fernow 8. Professor E. L. PALMER and Assistant Professor JOHNSON.

Special problems in science teaching.

227. **Seminar in Elementary Education.** Spring term. Credit two hours. S 9–10.40. East Roberts 223. Professor MOORE.

228. **Seminar in Child Guidance (Family Life 350).** Spring term. Credit two hours. For graduate students who have had some child guidance. F 4–6. Martha Van Rensselaer G-58. Professor WARING.

232. **Advanced Problems of Teaching in Vocational Agriculture.** Spring term. Credit two hours. For seniors and graduate students in vocational education; for others by permission. Hours to be arranged. Associate Professor HOSKINS.

234. **Seminar.** Spring term. Credit two hours. Open to graduate students contemplating research in education, and who have permission to register. W 2–4. Warren 140. Associate Professor W. A. SMITH.

A consideration of scientific method applied in education through graduate studies and other educational research.

235. **Seminar in Teaching Home Economics.** Spring term. Credit two hours. Students will need to consult the instructor before registering. Hours to be arranged. Professor THURSTON.

This course provides opportunity for graduate study of methods in home-economics education and for field work. It is intended for secondary-school teachers, extension workers, college teachers, supervisors, those who prepare teachers, and other leaders in home economics. Individual problems may include experiments, observation, and practice in teaching and supervision. It is especially recommended in connection with courses 248, 249, and 269.

249. **Seminar in Home Economics Education.** Fall and spring terms. Credit two to four hours either term; total credit for the year not to exceed six hours. S 10–12 and other hours to be arranged. Field work is required. Students must consult the instructor before registering. Professor THURSTON.

Designed to meet the needs of graduate students who have had experience as home-economics educators in schools, colleges, extension service, and so forth. Arrangements are made for students to work on their individual problems. Courses in philosophy and principles of education, psychology, guidance, curriculum, and measurement are recommended as prerequisites or parallel.

Preparation of Teachers for Normal Schools and Colleges

[241. **The Preparation of Teachers for Normal Schools and Colleges.** Spring term. Credit two hours. Professor Moore.] Not given in 1944–45.

245. **The Technical and Professional Preparation of Teachers of Agriculture.** Spring term. Credit three hours. Should follow course 211a or its equivalent. T Th 11–12.20. Warren 140. Professor Stewart.

A course designed to study critically in the light of the teaching of agriculture in secondary schools the programs of teacher education in the colleges of agriculture.

[248. **The Preparation of Teachers of Home Economics for Secondary Schools.** Spring term. Credit two hours. Professor Thurston.] Not given in 1944–45.

250. **Seminar in Agricultural Education.** Fall term. Credit two hours. For students whose progress in graduate study is satisfactory. T 4–5.30. Stone 309. Professor Stewart.

Measurement and Statistics

251. **Educational Measurement** Spring term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. Prerequisite, a course in educational psychology. S 11–12.30 and an additional hour to be arranged. Roberts 492. Assistant Professor Bayne.

The use of aptitude and achievement tests and other measuring instruments in the classification and guidance of pupils, improvement of instruction and other activities of the teacher and school officer. Those class members who wish may make a study of their own aptitudes and achievements.

253. **Introduction to Educational Statistics.** Fall term. Credit three hours. T Th 10 and an hour to be arranged. Stone 309. Assistant Professor Bayne.

A study of common statistical procedures in relation to critical reading of technical studies, research, and writing reports of studies. As far as possible the work is related to the problems of the individual.

253a. **Statistical Instruments in Education.** Spring term. Credit two hours. Prerequisite, a first course in statistics and permission of the instructor. T 10 and a period to be arranged. Stone 309. Assistant Professor Bayne.

Material covered depends upon the interests and problems of the members of the class.

Administration and Supervision

143a. **Curriculum Building in Industrial and Technical Education.** Fall term. Credit two hours. Th 4–5.45. Curriculum Laboratory, Sibley Dome Basement. Professor Emerson.

[143b. **Development of Instructional Material in Industrial and Technical Education.** Credit two hours. Professor Emerson.] Not given in 1944–45.

243. **Administration of Industrial and Technical Education.** Fall term. Credit two hours T 4–5.45. Curriculum Laboratory, Sibley Dome Basement. Professor Emerson.

243a. **Supervision of Industrial and Technical Education.** Spring term. Credit two hours. T 4–5.45. Curriculum Laboratory, Sibley Dome Basement. Professor Emerson.

246. **Seminar in Industrial and Technical Education.** Spring term. Credit two hours. Th 4–5.45. Curriculum Laboratory, Sibley Dome Basement. Professor EMERSON.

260a. **Organization and Administration of the Secondary School.** Fall term. Credit two hours. M W 2. Stone 309. Professor FERRISS.

A course in the organization and administration of the secondary school.

261a. **Fundamentals of Educational Organization and Administration.** Fall term. Credit three hours. T Th 11–12.30. Stone 309. Professor BUTTERWORTH.

A consideration of the main problems in organizing and administering the school program, including the services provided when school and community cooperate in meeting educational needs.

262a. **School Finance.** Spring term. Credit two hours. Prerequisite, 261a or the equivalent. M W 11. Stone 309. Professor BUTTERWORTH.

Typical problems: how local school funds are levied, collected, and disbursed; cost accounting; budget making; bonding; sources of state funds and their distribution. The discussion is based upon actual problems; prospective members of the class are urged, therefore, to bring with them financial data regarding their schools.

262c. **The School Plant.** Spring term. Credit two hours. Prerequisite, 261a or the equivalent. S 11–12.30. Stone 309. Professor BUTTERWORTH.

The planning and utilization of the school building to serve community needs.

263. **Procedures and Techniques in Supervision.** Fall term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. M W F 10. Stone 309. Professor MOORE.

Designed for superintendents, supervisors, and principals. Students taking this course must be prepared to spend four full days or more in observing supervisory procedures in various school systems.

264. **Seminar in Rural School Administration.** Spring term. Credit two hours. T 4.15–5.45. Warren 201. Professor BUTTERWORTH.

Topic to be announced.

265. **Seminar for Principals.** Fall term. Credit two hours. Required of all graduate students who are candidates for a principal's certificate. S 9–11. Stone 309. Professor MOORE.

266. **The Supervision of the Elementary School.** Spring term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. M W F 9. Stone 309. Professor MOORE.

A course designed for supervisors, elementary-school principals, and superintendents.

[267. **The Organization and Administration of Vocational Agriculture in the Public Schools.** Spring term. Credit three hours. Should follow or accompany course 261 or its equivalent. Professor STEWART.] Not given in 1944–45.

267b. **The Supervision of Vocational Agriculture in the Secondary School.** Fall term. Credit two hours. Open to teachers, supervisors, principals, district superintendents, and other educational leaders responsible for supervision in this field. S 10–12. Plant Science 143. Associate Professor W. A. SMITH.

A consideration of the supervisory and professional improvement needs of teachers of vocational agriculture and the procedures and techniques to supervision.

268. **Seminar in Rural Educational Leadership.** Fall term. Credit three hours. M W 3.30–5. Stone 309. Professors BUTTERWORTH, FERRISS, and others.

A consideration of the problems especially significant in rural areas. Planned for superintendents, principals, extension specialists, social workers, and others preparing for leadership responsibilities in rural education.

269. **The Supervision of Home Economics Education.** Spring term. Credit two hours. Students must consult the instructor before registering. Time to be arranged. Professor THURSTON.

For persons who are now engaged in supervision and in the education of teachers in service and for those who wish to prepare for such work. Field work is required.

276. **Principles of Curriculum Building.** Fall term. Credit three or four hours. Primarily for graduate students. T Th 2–3.30, and an additional hour to be arranged for those wishing to carry further the study of special curriculum problems. Stone 309. Professor FERRISS.

A consideration of the major problems, principles, and techniques in determining educational objectives and curriculum content and organization in elementary and secondary schools in the light of modern theory and practice.

[277. **Courses of Study in Vocational Agriculture.** Spring term. Credit two hours. Associate Professor HOSKINS.] Not given in 1944–45.

[278. **Seminar in Rural Secondary Education.** Spring term. Credit two hours. Professor FERRISS.] Not given in 1944–45.

[293. **Seminar in the Social and Economic Problems of the School Administrator.** Spring term. Credit three hours. Professor BUTTERWORTH.] Not given in 1944–45.

EDUCATIONAL THEORY

120. **Social Foundation of Education.** Fall or spring term. Credit three hours. Students should register for the course number which corresponds to the section they take, as follows:

Fall term

120a. Lectures, M W F 9. Warren 240. Professor MOORE.

[*120b. Professor H. R. ANDERSON.] Not given in 1944–45.

Spring term

[120a. Professor MOORE.] Not given in 1944–45.

*120b. Lectures, T Th S 11. Boardman 121. Professor H. R. ANDERSON.

This course evaluates the school as a social institution and emphasizes the rôle the school must play in preserving American democracy. Fee, $1.

[194. **Principles of Vocational Education.** Fall term. Credit three hours. Professor ————.] Not given in 1944–45.

220. **Philosophy of Education.** Credit two hours. Offered for a two-hour period once a week during the spring term at such time as will not interfere with the student's apprentice teaching. Time and place of meeting to be arranged. Professor ————.

For fifth-year students in preparation for secondary-school teaching under the five-year program. A coordinating course in the professional sequence designed chiefly to develop a critical appreciation of teaching enterprise. It centers, therefore, upon the question of values in education and calls for examination and judgment of aims and content from that standpoint. Every student is required to undertake a study in valuation of the teaching enterprise in his own field of specialization.

281. **Rural Secondary Education.** Fall term. Credit three hours. Primarily for graduate students. M W F 9. Stone 309. Professor FERRISS.

A consideration of some of the more basic problems in the functions, nature, organization, curriculum, and extension of secondary education in its adaptation to rural and village needs and conditions.

290. **Interdepartmental Seminar on Rural Reconstruction in Various Countries.** Spring term. Credit two hours. M 2–3.30. Warren 302. Professor STEWART and members of the staffs of the following departments cooperating: Agricultural Economics, Home Economics, Hygiene and Preventive Medicine, Rural Education, and Rural Sociology.

*Does not count as an agricultural elective for students in the College of Agriculture.

A consideration of such social, economic, and educational, and related problems as affect individual and community development.

[294a. **The Evolution of Educational Theory.** Fall term. Credit three hours. Professor ————.] Not given in 1944–45.

[294b. **Theory of Values in Education.** Spring term. Credit two hours. Professor ————.] Not given in 1944–45.

294c. **Philosophy of Education.** Spring term. Credit two hours. W 4–5.40. Warren 201. Professor MOORE.

[295. **Comparative Education.** Fall term. Credit two hours. Professors BUTTERWORTH, FERRISS, and MOORE.] Not given in 1944–45.

NATURE STUDY

106. **Outdoor Living.** Spring term. Credit two hours. S 9–12.30, with two overnight trips. Fernow 8. Professor E. L. PALMER and Miss GORDON.

A study of outdoor living, with practice in understanding the terrain, methods of camping and hiking, primitive means of survival. Laboratory fee, $5.

107a. **The Teaching of Nature Study and Elementary School Science.** Fall term. Credit two hours. Open to juniors, seniors, and graduate students. For those who are preparing to teach or supervise science. Lecture, Th 8. Practical exercises, Th 1.40–4. Fernow 8. Professor E. L. PALMER and Miss GORDON.

The content and methods of nature-study and of elementary-school science, with field work and laboratory experience useful in classroom and camp. Laboratory fee, $1.50.

108. **Field Natural History.** Fall term. Credit two hours. Lecture, T 4. Fernow 8. Field work, T 1.40–4. Professor E. L. PALMER and Miss GORDON.

Field trips and lectures devoted to a study of the natural history of five ecological units under different seasonal conditions, with special emphasis on their contributions to the teaching of science. Laboratory fee, $1.

[202. **Nature Literature.** Fall term. Credit two hours. Open to seniors and graduate students interested in science and science teaching. Professor E. L. PALMER and Miss GORDON.] Not given in 1944–45.

205. **The Teaching of Conservation.** Spring term. Credit two hours. Undergraduates and graduates. T Th 9. Fernow 8. Professor E. L. PALMER and Miss GORDON.

Consideration of the principles, materials, and methods of conservation education useful to teachers, and others engaged in teaching of the wise use of the resources of the nation.

[209. **The Nature Movement and Its Makers.** Fall term. Credit two hours. Professor E. L. PALMER and Miss GORDON.] Not given in 1944–45.

GUIDANCE

217. **Use and Interpretation of Tests in Guidance and Personnel Administration.** Fall term. Credit two hours. Open to students in guidance or personnel administration. Th 4–6. Warren 340. Professor WINSOR.

This course deals with the development, use, and interpretation of aptitude tests as a basis for guidance and selection.

282. **Educational and Vocational Guidance.** Fall term. Credit two hours. Planned primarily for graduate students but a small number of undergraduates with a background of experience are admitted upon permission of the instructor. W 4–6. Warren 140. Mr. H. J. PALMER.

This is an information course. It is designed to familiarize students with (1) the history, principles, and place of guidance in a democratic society; (2) methods of collecting, classifying, interpreting, and disseminating various types of infor-

mation essential to a successful guidance program (educational, occupational, community, and so on); (3) placement procedures and employment supervision.

283. **Counseling Methods.** Spring term. Credit two hours. Planned primarily for graduate students. W 4–6. Warren 140. Mr. H. J. PALMER.

Techniques for collecting, integrating, and utilizing information about the individual.

The following techniques used in the collection and interpretation of information pertinent to counseling are considered: interviews, observations, records, reports, case studies, and conferences.

INFORMAL STUDY

199. **Informal Study in Education.** Maximum credit, three hours each term. Members of the staff.

This privilege is granted to a qualified student of junior rank or above, with the approval of his adviser and the consent of the appropriate member of the Education staff.

RESEARCH

300. **Special Studies.** Credit as arranged. Members of the staff.

Students working on theses or other research projects may register for this course. The staff members concerned must be consulted before registration.

RURAL SOCIOLOGY

Undergraduate courses in Rural Sociology are offered for those preparing for extension service, rural teaching, or any professional or executive occupation in rural communities. Courses 1 and 12 give a broad knowledge of human society, and particularly of rural society, essential to a better orientation in meeting current social problems. Other courses give training for professional work in rural sociology, but should be followed by graduate study.

Although full professional training for rural social work is not offered, there is at present a definite demand for college graduates who have had a general preliminary training in this field, due to many calls for professionally trained social workers by wartime agencies. Experience has shown that most of those with ability and aptitude in this field will probably be able to obtain positions upon graduation. Such practical experience will be an advantage before commencing graduate professional training. Considerable farm or rural experience is looked upon as an essential qualification.

The practice courses 123 to 126, with courses 1, 12, 111, 112, and 133, supplemented by related courses in other departments of the University, furnish an adequate preparation for many positions which will be available. A suggested curriculum to this end is available from this department.

1. **General Sociology.** Fall or spring term. Credit three hours. Not open to freshmen except in the second term to those with high scholastic records and upon approval of the instructor. Lectures and discussions, M W F 8. Warren 25. Professor ANDERSON.

This course precedes all others in the department. Its object is to create an understanding of various types of groups, institutions, and organizations that exist in human society. It is an analysis of the human environment in which the individual lives. Both urban and rural society are considered. Fee for materials, $1.

207. **Sociological Theory.** Fall and spring terms. Credit three hours a term. Alternates with course 208. Given in alternate years. Prerequisite, permission to register. T Th S 9. Warren 302. Professor ANDERSON.

A course devoted to the critical analysis of sociological theories from the time of Auguste Comte to those of present-day sociologists.

[208. **Systematic Sociology.** Fall and spring terms. Credit three hours a term. Given in alternate years. For graduate students. Professor ANDERSON.] Not given in 1944–45.

This course is designed to present the whole field of study, with special emphasis on the concepts in a system of sociology.

[209. **Seminar.** Spring term. Credit two hours. Given in alternate years. For graduate students. Professor ————.] Not given in 1944–45.

The structural characteristics and classification of different types of social groups as related to their functions are studied.

111. **Rural Community Organization.** Spring term. Credit three hours. Open to seniors and graduate students. Prerequisite, Courses 1 and 12 or the permission of the instructor. Lectures and discussions, T Th S 10. Warren 302. Professor ————.

The application of sociology to the practical problems of community organization. The course covers three main divisions: the use of community organization as a tool for guiding social changes; a critical study of New York State rural-community organizations; methods of making organizations effective through developing rural leadership, analyzing community needs, building community programs, and coordinating programs.

[211. **The Rural Community.** Fall term. Credit two hours. Given in alternate years. Primarily for graduate students. Prerequisite, courses 1 and 12 or their equivalent. Professor ————.] Not given in 1944–45.

A study of the historical development of the rural community; a comparative study of types of rural communities; the rural community as a sociological group and its place in society; methods of community development and organization.

12. **Rural Sociology.** Fall term. Credit three hours. Open only to juniors and seniors. Course 1, or its equivalent, is recommended as prerequisite, but not required. Lectures, discussions, and special reports. T Th S 11. Warren 325. Professor ————.

A study of the groups, organizations, and institutions found in rural society, their structure and function, and a consideration of means for the improvement of rural-social organization.

112. **Rural Recreation.** Fall term. Credit three hours. Prerequisite, course 1 or 12. T Th 9, and a two-hour laboratory period, to be arranged. Warren 340. Extension Assistant Professor DUTHIE.

A general orientation in the various types of recreational activities, and the methods in which they may be organized to best serve the needs of the rural community. Laboratory fee, $1.

212. **Rural Sociology.** Fall term. Credit four hours. Prerequisite, course 1. Lectures, discussions, and special reports. This is the same as course 12, with a one-hour discussion period for graduate students only. T Th S 11, and one hour to be arranged. Warren 325. Professor ————.

213. **Research in Rural Social Organization.** Fall and spring terms. For qualified seniors and graduate students. Hours and credits to be arranged. Professor ANDERSON.

217. **Seminar in the History of Research in Rural Sociology.** Spring term. Credit three hours. Given in alternate years. Primarily for graduate students. Hours to be arranged. Professor ANDERSON.

123. **Practice in Social Work Agencies.** Fall and spring terms. Hours and credit to be arranged. Open only to juniors and seniors interested in becoming welfare workers or group leaders. Prerequisite, course 124. Through actual practice, under supervision, in welfare institutions, settlement houses, recreation centers, boys' and girls' clubs, and in local welfare agency offices, students gain acquaintance with social-welfare programs and the organization and functioning of social-welfare agencies. Assistant Professor STRODE.

124. **Social Case Work I.** Fall term. Credit three hours. Prerequisite, course 1, one course in psychology, and Sociology 10, or equivalents. M W F 9. Warren 340. Assistant Professor STRODE.

An introduction to the history, principles, and practice of social case work in public and private-welfare agencies, including an analysis of the case-study method and the use and development of social resources. Fee for materials, $1.

125. **Social Case Work II.** Spring term. Credit three hours. Prerequisite, course 124. M W F 9. Warren 340. Assistant Professor STRODE.

Study of social-work practice and procedures in public-welfare agencies, with special reference to case material from rural areas.

126. **Skills in Case Work.** Fall term. Credit three hours. Prerequisite, course 124. M W F 8. Warren 340. Assistant Professor STRODE.

Analysis of the skills that are essential equipment for the case worker. Research to illustrate their functioning and projects to aid the student in acquiring facility in their use.

132. **Rural Leadership.** Fall term. Credit two hours. For juniors, seniors, and graduate students. Prerequisite, course 1 and permission of instructor. Th 2. Warren 302. Professor ————.

A seminar course in which leadership is studied from both sociological and psychological points of view.

133. **Group Leadership.** Fall term. Credit three hours. Open to upperclass students with permission of instructor. M W 12, and hour to be arranged. Warren 302. Extension Assistant Professor DUTHIE.

A consideration of the factors involved in group formation, the relationships of the leader to the group, and the group members to each other. The place of the program in group work and the process of program formation are described, with special reference to work with 4-H Clubs, Scouts, and juvenile groups.

Related courses are offered in the Department of Sociology and Anthropology, College of Arts and Sciences, and in the Department of Family Life, College of Home Economics. Particular attention is called to Social Psychology, an interdepartmental course in the College of Arts and Sciences, and to the following courses in the Department of Sociology and Anthropology:

10. **The Family.**

20. **Social Pathology.**

VEGETABLE CROPS

Students planning to specialize to a greater or less degree in vegetable crops should consult the department regarding choice and sequence of courses. A mimeographed sheet outlines the suggestions.

1. **Vegetable Crops.** Spring term. Credit three hours. Lectures, M W 11. East Roberts 222. Laboratory, M or T 1.40–4. Vegetable greenhouses and East Ithaca gardens. Professor WORK.

A general study of the principles of vegetable growing and handling, giving a comprehensive survey of the industry. Intended for the student who desires a brief general course, and as an introductory course for the student who wishes to specialize in commercial vegetable growing. Economic importance, geography, cultural requirements, marketing, storage, and uses of the important vegetables. A one-day trip is required, usually the last Saturday of the term; approximate cost, $3. Laboratory fee, $2.

2. **Special Cash Crops.** Spring term. Credit three hours. Lectures, T Th 10. East Roberts 222. Laboratory, W or Th 1.40–4. East Roberts 223. Professor HARDENBURG.

A study of the major cash-crop vegetables grown in New York, including potatoes, field beans, cabbage, and the important canning crops, peas, tomatoes,

sweet corn, and snap beans. About one-half of the term's work is devoted to potatoes. A visit to a near-by bean elevator is required. Laboratory fee, $2.50.

12. **Grading and Handling Vegetable Crops.** Fall term. Credit three hours. Lectures, T Th 10. East Roberts 222. Laboratory, T or W 1.40–4. East Roberts 223, vegetable greenhouses, and East Ithaca gardens. Professor WORK.

Geography of vegetable production and distribution. Factors of environment, culture, and handling as affecting quality, condition, and marketing of vegetable crops. Harvesting, grades and grading, packing, shipping-point and terminal-market inspection, transportation, refrigeration, and storage are discussed with reference to the various crops. A two-day trip is required; maximum cost, $10. Laboratory fee, $2.50.

101. **Vegetable Crops, Advanced Course.** Fall term. Credit four hours. Prerequisite, course 1 and Botany 31. Lectures, M W F 9. One conference period to be arranged. East Roberts 223. Professor THOMPSON.

A course devoted to a systematic study of the sources of knowledge and opinions as to practices in vegetable production and handling. Results of experiments that have been concluded or are being conducted are studied, and their application to the solution of practical problems is discussed.

113. **Types and Varieties of Vegetables.** To be given during two weeks, September 18 to 29, 1944, with registration for the course in the fall term. Credit two hours. Two lectures and two laboratories each day, M T W Th F 8–12 and 1.30–4.30. Work for an additional hour of credit may be arranged. Advance notice of intention to register is requested. Prerequisite, course 1 or 2 or permission to register. Professor WORK.

This course deals with the taxonomy, origin, history, characteristics, adaptation, identification, classification, exhibition, and judging, of kinds and varieties of vegetables; the characteristics, production, and handling of vegetable seeds. The leading varieties of the vegetable crops are grown each year. The value of the course depends to a great extent upon gaining an acquaintance with the plant material as it grows. Laboratory fee, $2.

225. **Special Topics in Vegetable Crops.** Spring term. Credit three hours. Given in alternate years. Primarily for graduate students. Prerequisite, course 101 and Botany 31. It is recommended that Botany 231 and 232 precede or accompany this course. Professors THOMPSON, WORK, RALEIGH, and ORA SMITH and Associate Professor PLATENIUS.

In this course the student is expected to review critically and to evaluate the more important research publications that deal with vegetable production, handling, and storage problems. In the discussions attention is given to research methods and technics.

231. **Research.** Fall and spring terms. For graduates and advanced undergraduates. Credit for undergraduates one or more hours a term, by arrangement. Professors THOMPSON, WORK, HARDENBURG, RALEIGH, and ORA SMITH, and Associate Professor PLATENIUS.

Special problems may be elected in any line of vegetable work. Summer residence is often necessary in connection with experimental problems.

232. **Seminar.** Fall and spring terms. Required of graduate students taking either a major or a minor in this department. Time to be arranged. East Roberts 222. Members of departmental staff.

WILDLIFE CONSERVATION AND MANAGEMENT

1. **The Conservation of Wildlife.** Fall term. Credit two hours. Lectures, T Th 11 and occasional evenings. Fernow 122. Professors GUISE, HILL, MUENSCHER, PALM, PALMER, WALKER, and A. H. WRIGHT, Associate Professor YOUNG, and cooperating specialists.

An introduction to the wildlife resources of North America; the importance of the flora and fauna in our economic and cultural life; the history of wildlife

decimation, the present need for conservation, and the methods employed to re-establish the various species.

[2. **Game Management.** Fall term. Credit three hours. Prerequisite, Zoology 1, 8, 9, and 131 and Botany 1 and 13, or permission to register. Professor ALLEN and cooperating specialists from the New York State Conservation Department, the United States Fish and Wildlife Service, and others.] Not given in 1944–45.

The principles and practices of game management as applied to field, woodland, and aquatic game. Laboratory studies of game species, predators, cover maps, management plans, and feeding methods. Field work includes demonstrations and practice in game surveys, sanctuary, and refuge methods, and other game-management practice. Laboratory fee, $3.

ZOOLOGY

For details of other courses in zoology not listed below see *Entomology,* and also the *Announcement of the College of Arts and Sciences.*

Course 1, in the College of Arts and Sciences, or its equivalent, is a prerequisite for all other courses in the department except 9.

8. **Elementary Taxonomy and Natural History of Vertebrates.** Fall and spring terms. Credit three hours a term. Lecture, M 8. Stimson G-25. Laboratory, M W 1.40–4 or T Th 1.40–4. Stimson 225. Professor A. H. WRIGHT, Doctor DUNHAM, and assistant.

Lectures on fishes, amphibia, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bionomics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring. During May field trips will be taken at 5.30 a.m. Laboratory fee, $4, not including transportation on field trips.

9. **General Ornithology.** Spring term. Credit three hours. Lecture, W 11. Fernow 122. Field work and laboratory, T Th 1.40–4. Fernow 210. Professor ALLEN and assistant.

Introduction to the study of birds, particularly the local species; their songs and habits; designed to give a working knowledge to those wishing to study birds as an avocation, and fundamental to those planning advanced work in ornithology. Laboratory work with birdskins is based on the field work. Laboratory fee, $3.

[22. **Ichthyology, Advanced Systematic and Field Zoology.** Fall term. Credit three hours. Professor A. H. WRIGHT.] Not given in 1944–45.

An amplification of the prerequisite course 8. In the lectures, special emphasis is laid on the principal phases of animal life; the taxonomy, origin, and evolution of fossil and living groups; geographical distribution; and the literature and institutions of zoology. Laboratory periods are devoted to the identification of exotic and indigenous forms. Laboratory fee, $4, not including transportation on field trips.

23. **Herpetology.** Fall term. Credit three hours. Lecture, T Th 8. Stimson G 25. Laboratory, F 1.40–4 or S 8–10.30. Professor A. H. WRIGHT.

An amplification of the prerequisite course 8. The lectures are devoted to the taxonomy, origin, and evolution of living amphibia and reptiles, and to their geographical distribution. Laboratory periods are devoted to the identification of exotic and indigenous forms. Laboratory fee, including transportation on field trips, $4.

[25. **Mammalogy.** Spring term. Credit three hours.] Not given in 1944–45.

Discussion of principal phases of mammalian life; origin, distribution, habits, and literature. Laboratory periods are devoted to methods of field collecting, census taking, life-history studies, preparation of skins and skeletons, and identi-

fication of North American species. Laboratory fee, $4, not including transportation on field trips.

30. **Heredity and Eugenics.** Fall term. Credit two hours. Prerequisite, Zoology 1, Biology 1, or equivalent. Lectures, W F 10. Rice 100. Professor HUTT.
The laws of heredity; a survey of inherited characters in man; biological principles applicable to betterment of the human race.

67. **Seminar in Systematic Vertebrate Zoology.** Fall term. Credit one hour. Lecture, T 7.30 p.m. Professor A. H. WRIGHT.
Life-zone plans of North America, 1817 to 1937, distribution and origin of life in North America; zoogeography of the Old World; animal coloration; other topics, to be announced.

[110. **Economic Zoology.** Fall term. Credit one hour. Open to qualified upperclassmen and graduate students majoring in zoology.] Not given in 1944–45.
This course is designed to meet the needs of the teacher, agriculturist, extension worker, and professional zoologist. Among the topics treated are: food and feeding habits of birds and mammals, the control of injurious species, fur farming and economics of fur resources, game birds and mammals, manner of effecting conservation legislation, and a consideration of the laws and their effectiveness in various States.

112. **Literature of Economic Zoology, Conservation, and Ecology.** Spring term. Credit one hour. Upperclassmen and graduate students only. T 7.30 p.m. Stimson 225. Professor A. H. WRIGHT.
The literature of economic zoology, ecology, limnology, oceanography, and kindred fields; fish and fisheries; amphibia, reptiles, and mammals; small and big game (commercial and sport); aquaria; zoological gardens, preserves; game farms; animals in relation to recreation, settlement, forestry, agriculture, and other industries; biologic resources, their exploration, conservation, utilization, and management.

[126. **Advanced Ornithology.** Fall term. Credit three hours. Prerequisite, courses 8, 9, and 11, or permission to register. Professor ALLEN.] Not given in 1944–45.
The structure and classification of birds; geographical distribution; the literature and institutions of ornithology; identification of representative birds of the world. The first part of the term is devoted to field work on the fall migration, and to the identification of birds in winter plumage. Designed primarily for students specializing in ornithology or animal biology. Laboratory fee, $3.

131. **Technique in Ornithology.** Spring term. Credit three hours. Prerequisite, courses 8 and 9, Botany 1 and 13, and Entomology 12, or permission to register. Lecture, W 9. Fernow 122. Laboratory, M W 1.40–4. Fernow 212. Professor ALLEN.
This course is intended primarily for students planning to teach biological science or to engage in professional work in ornithology or wildlife management. Feeding habits of birds, field collecting, preparation of specimens, and natural history photography are emphasized, together with classroom, museum, extension, and biological survey methods. Opportunity is also given for the preparation of radio talks. Laboratory fee, $3.

[133. **Bird Speciation and Museum Methods in Ornithology.** Fall term. Credit three hours. For students planning to participate in scientific expeditions and to carry on taxonomic work in ornithology. Prerequisite, courses 8, 9, 11, 126, and 131, or permission to register.] Not given in 1944–45.
This course includes such subjects as: field and museum equipment; collecting and preparing birdskins and the preparation of taxonomic papers and avifaunal lists, drawings in line, half-tone, or full color, and other illustrative material. Laboratory fee, $3.

136. **Seminar in Ornithology.** Fall and spring terms. Without credit. Open to qualified undergraduates and required of all graduate students in ornithology. M 7.30–9. Fernow Seminar Room.

400. **Research Problems.** Credit and hours to be arranged. Limited to seniors. Problems may be undertaken in any phase of zoology, but the consent of the instructor concerned is a prerequisite.

COURSES IN OTHER COLLEGES THAT MAY BE OFFERED TO MEET THE SPECIFIC REQUIREMENTS OF REGULAR STUDENTS IN THE COLLEGE OF AGRICULTURE

2a. **English: Introductory Course in Reading and Writing.** Fall term. Credit three hours. M W F 8, 9, 10, 11, 12, and T Th S 8, 9, 10, 11. Rooms to be announced.

The aim of the course is to increase the student's ability to communicate his own thought and to understand the thought of others. The fall term is devoted primarily to the study of good diction, effective sentences, and the logic of paragraphs, the spring term to whole composition. Assignment to sections is made in *Barton Hall*. Professor SALE is in charge of the course.

2b. **English: Introductory Course in Reading and Writing.** Spring term. Credit three hours. Prerequisite, course 2a or the equivalent. M W F 8, 9, 10, 11, 12, and T Th S 8, 9, 10, 11. Rooms to be announced.

The aim of the course is to increase the student's ability to communicate his own thought and to understand the thought of others. The fall term is devoted primarily to the study of good diction, effective sentences, and the logic of paragraphs, the spring term to whole compositions. Assignment to sections is made in Barton Hall. Professor SALE is in charge of the course.

1. **General Chemistry (Navy Chemistry I).** Repeated each term. Credit four hours. Lectures, Th S 8 or 9. Main Lecture Room, Baker 200. Laboratory, M W or F 1.40–4.30. Baker 150. Recitation, one hour to be arranged. Professor BROWNE and assistants. Deposit, $13.50.

1a. **General Chemistry (Navy Chemistry Ia).** Repeated each term. Credit four hours. Lecture, Th S 8 or 9. Main Lecture Room, Baker 200. Laboratory, M T W Th or F 1.40–4.30 or S 9–12. Baker 50 and 150. Recitation, one hour to be arranged. Professor BROWNE and assistants.

This course, together with Chemistry 2a is substantially the equivalent of Chemistry 102 or 104. Deposit, $13.50.

2. **General Chemistry (Navy Chemistry II).** Repeated each term. Credit four hours. Prerequisite, Course 1 or 1a. Lectures, T Th 11. Baker 207. Laboratory, T Th 1.40–4.30. Baker 50. Assistant Professor BAUER and assistants.

Chemistry 1 and 2 cover substantially the equivalent of Chemistry 102 or 104. In addition, Chemistry 2 includes an introduction to qualitative analysis and serves as a prerequisite for the courses in quantitative analysis. Students who want six hours of general chemistry with no qualitative analysis should register for Chemistry 2a instead of Chemistry 2. Deposit, $20.

2a. **General Chemistry (Navy Chemistry, IIa).** Repeated each term. Credit two hours. Prerequisite, course 1 or 1a. Lecture, T 8 or 9. Main Lecture Room, Baker 200. Laboratory, M T W Th or F 1.40–4.30 or S 8–11. Baker 150. Recitation, one hour to be arranged. Mr. RUBIN and assistants. Deposit, $13.50.

100. **Introductory Geology.** Fall or spring term. Credit three hours. Lectures, M W 10. McGraw Lecture Room. Laboratory, M W Th 1.40–4. McGraw. Students must register for laboratory assignment before the beginning of the course. Professor NEVIN.

This course is planned to give beginners the fundamental principles of this branch of science. Laboratory fee: fall term, $3; spring term, including field trips, $4.25.

3. **Introductory Experimental Physics.** Fall term. Credit three hours. Demonstration lectures, W S 9 or 11. Rockefeller A. One laboratory period a

week, as arranged. Rockefeller 220. One recitation period a week, as arranged, required of students who do not offer entrance physics, but open to others. Professor GRANTHAM and assistants.

Mechanics, properties of matter, sound, and heat. Laboratory fee, $5.

4. **Introductory Experimental Physics.** Spring term. Credit three hours. A continuation of course 3. Prerequisite, course 3 or entrance physics. Lectures, W S 9 or 11. Professor GRANTHAM and assistants.

Electricity, magnetism, and light. Laboratory fee, $5.

1. **Introductory Zoology.** Fall and spring terms. Credit three hours a term. If taken after General Biology 1, credit two hours a term. Lectures, T Th 9 or 11. Stimson G-25. Laboratory, M T W Th or F 1.40–4, or S 8–10.20. Stimson 102, 104, and 116. Associate Professors YOUNG and LEONARD and assistants.

Fall term: A survey of invertebrate animals. Consideration of how each of the different body plans possessed by animals without backbones provides for the essential life activities. Also a discussion of the phylogenetic relationships existing between such groups of animals.

Spring term: A survey of the anatomy and physiology of the vertebrate organ systems, biological principles, and evolution. Laboratory fee, $3 a term.

UNIVERSITY REQUIREMENTS IN MILITARY SCIENCE AND TACTICS, AND PHYSICAL TRAINING

MILITARY SCIENCE AND TACTICS

1. **Basic Course.** Required. Throughout the year. The complete course covers two years. Every able-bodied male student who is an American citizen, a candidate for a baccalaureate degree, who is required to take five, six, seven, eight, or more terms in residence (or the equivalent in scholastic hours), must take, in addition to the scholastic requirements for the degree, one, two, three, or four terms, respectively, in the Department of Military Science and Tactics. Three hours a week, M T W Th F or S 8 or 9. Practice, M T W Th or F 1.40–3.40 or S 10–12. Barton Hall.

The requirements in Military Science and Tactics must be completed in the first terms of residence; otherwise the student is not permitted to register again in the University without the consent of the University Faculty.

The course of training is that prescribed by the War Department for Senior Division Units of the Reserve Officers' Training Corps for basic students. The Basic course comprises the instruction required for basic training common to all Arms and Service of the Army. For details concerning the course see the *Announcement of the Department of Military Science and Tactics.*

Advanced standing. With the approval of the Department of Military Science and Tactics, credit may be allowed a student for all or part of the Basic Course requirement, upon presentation of evidence of satisfactory work completed in an approved institution.

PHYSICAL TRAINING

10. **Physical Training for Men.** Twice a week for freshmen and sophomores; three times a week for juniors and seniors. One hour credit. M T W Th F 8, 9, 10, 11, 1.40, 2.40, 4.30; S 8, 9, 10, 11. Barton Hall, Old Armory, Schoellkopf. Mr. JAMES and coaching staff.

6. **Physical Training for Women (Freshmen).** Throughout the year, three periods a week. One term each of Fundamentals and Rhythmics required. Credit one hour a term. Mrs. BAIRD and Misses ATHERTON, BATEMAN, STEWART, ————, ————.

7. **Physical Training for Women (Sophomores).** Throughout the year, three periods a week. Credit one hour a term. Mrs. BAIRD and Misses ATHERTON, BATEMAN, STEWART, ————, ————.

Activities include: fundamentals in folk, square, and modern dance, recreational leadership, individual gymnastics, outing, riding, rhythmics, riflery, swimming, badminton, basketball, bowling, fencing, archery, baseball, field hockey, soccer, tennis, canoeing, golf.

GENERAL INFORMATION

THE BUILDINGS

The buildings erected under the enactment of 1904 were first occupied in June, 1907. The central group then erected consisted of a main administrative and classroom building, Roberts Hall, connected by covered loggias with the Dairy Building, now East Roberts, on the east, and with Stone Hall, now occupied by the Department of Rural Education and by the College Library, on the west. Subsequently, the Legislature provided for the erection of two large barns, a greenhouse range, a forestry building (Fernow Hall), a poultry-husbandry building (Rice Hall), a soils building (Caldwell Hall), an auditorium, a classroom building (Wing Hall), and a stock-judging building for animal husbandry, several small poultry buildings, a sheep barn, a swine barn, a farm shop and tool shed, and an insectary. There are, in addition, a fish-breeding house in Cascadilla Creek, a seed-storage house, a cold-storage and packing house, and other small buildings on the farms. In 1920 the State authorized the College to plan a further development of its building program involving an expenditure of $3,000,000. Under this building plan $500,000 was appropriated in 1920 for a new dairy building, and in 1922 provision was made for its equipment. The building came into use in the fall of 1923. A further appropriation of similar amount was used for completing the Dairy Building, erecting an additional greenhouse range, moving and remodeling the Agricultural Engineering laboratories, and constructing the foundation for the Plant Science Building. The last-named building was completed under an appropriation of $1,100,000 made by the Legislature of 1928, and occupancy began with the second term of 1930–31. The Legislature of 1930 provided $400,000 for the equipment of the Plant Science Building and appropriated $100,000 for additional barns and other smaller buildings for the Department of Animal Husbandry. It also appropriated $100,000 for the construction of the foundation of a building for the Departments of Agricultural Economics and Rural Sociology, and to this sum the Legislature of 1931 added $500,000 for the completion of the building. The new barns for sheep, swine, and beef cattle were completed in 1931. The Departments of Agricultural Economics and Rural Sociology occupied their new building, more recently named Warren Hall, in February 1933. In 1934–35 the completion of a new Home Economics building, named Martha Van Rensselaer Hall, made it possible to move the Department of Entomology into the building previously occupied by the College of Home Economics. The building is now named Comstock Hall. The horse barn and the sheep barn were destroyed by fire in 1938 and have subsequently been replaced.

THE FARMS

The College of Agriculture farm includes 1992 acres. It is run not for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, little more than one-half of the total area is now available for tillage. Of the 1992 acres, 1144 are classified as arable, 450 as pasture, and 333 as wood and waste, and 65 are devoted to buildings, lots, and gardens. There are in addition 95 acres of tillable land rented by the College.

Part of the tillable area has been assigned to departments as follows: Agronomy, 22 acres; Animal Husbandry, 412 acres; Floriculture and Ornamental Horticulture, 26 acres; Plant Breeding, 67 acres; Pomology, 99 acres; Poultry Husbandry, 142 acres; Vegetable Crops, 23 acres; and there are left to the Office of Farm Practice and Farm Superintendence 353 acres on which to conduct the regular farm operations. Of the other areas, the Department of Animal Husbandry has the use of all the pasture land; the Department of Forestry administers 131 acres of woodland in cooperation with other Departments of the College and University; and the Department of Entomology uses about 5 acres of waste land for a fish hatchery.

The college farm is composed of a variety of soil types. About two-thirds of the tillable area is Dunkirk clay loam. This soil is entirely unsuited to potatoes, and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The remaining third is Canfield silt loam, Wooster gravelly silt loam, and Volusia gravelly silt loam.

In addition to the lands mentioned, a number of areas are used by various departments of the College as outlined in the following paragraphs.

The College has a long-term lease of about 500 acres of Federal land on Mount Pleasant and Turkey Hill. This is used by the Departments of Animal Husbandry and Agronomy and for experimental work in forest soils.

The State Conservation Department also has made available for an indefinite period 50 acres of excellent land near Tully. This land is used by several departments of the College for experimental work.

There has been conveyed to Cornell University the Matthias H. Arnot Forest of 4024 acres, for the use of the Department of Forestry. Over the great part of its area the Arnot Forest is made up of second-growth hardwoods and hemlock. It lies mostly in Schuyler County, near the village of Cayuta and within twenty miles of Ithaca.

Through the generosity of Mr. John P. Young, an area of 518 acres has been given to the University. This consists of several parcels of land, both wooded and open, in the Connecticut Hill region, some fifteen miles west of Ithaca, and well adapted to research work and graduate instruction in forestry and in the plant sciences generally.

A square mile of typical Adirondack timberland in Essex and Hamilton Counties has been deeded to Cornell University by Finch, Pruyn, and Company for forest experiments to be conducted by the Departments of Forestry in collaboration with the United States Forest Service. This tract is known as the Finch-Pruyn Co-operative Experimental Forest.

The Curtis G. Lloyd areas at McLean, Ringwood, and Slaterville, amounting to 573 acres, are available to students in the Departments of Botany and Biology.

THE COLLEGE LIBRARIES

The library facilities of the College of Agriculture include: a large collection of books and periodicals on agriculture, animal husbandry, botany, horticulture, forestry, entomology, and other kindred subjects, contained in the University Library and numbering about fifty thousand volumes; the Agricultural College Library in Stone Hall, with a working and reference collection of more than one hundred and thirty thousand bound volumes and a large number of bulletins, reports, and other pamphlets in unbound form; and various small departmental collections for laboratory and office use. Included in these are the Craig horticultural library, gift of the widow of the late Professor John Craig, and the A. I. Root Memorial Library, recently begun but already containing more than fifteen hundred volumes in the field of apiculture. The Department of Animal Husbandry has a large and rapidly increasing collection of herdbooks, registers, and the like, for the use of its instructing staff and its students. Altogether more than one hundred and eighty thousand volumes are available for the instructing staff and the students of the College of Agriculture. Wherever they are housed, the books are regularly catalogued at the University Library, as well as at the Agricultural College Library.

All these libraries are likewise provided with the principal periodicals relating to agriculture and kindred subjects. In the University Library are to be found files and current numbers of many leading foreign periodicals, especially those of a purely scientific character used chiefly for research. The Agricultural College Library carries on its shelves more than eight hundred periodicals of various kinds for the use of students and faculty; these include the principal agricultural, horticultural, and stock-raising journals of the United States and Canada, together with many from other countries. The Entomological Library is supplied with the leading periodicals relating to general and economic entomology. In addition to these, many of the departments receive periodicals for the use of instructors and students; and the Departments of Agricultural Economics, Animal Husbandry, Dairy Industry, Floriculture and Ornamental Horticulture, Forestry, Plant Breeding, Plant Pathology, and Poultry Husbandry maintain small reading rooms of their own.

Certain of the books of the Agricultural College library are likely to be in reserve for reference purposes only, and students are then allowed to draw them for home use only when the library is closed over night and over Sunday. To afford the greatest possible opportunity for using the books, the Agricultural College Library is open from eight in the morning until ten o'clock at night every day of the week during the college year except Saturday, when it is closed at five o'clock in the afternoon.

SCHOLARSHIPS

The State University Scholarships

The State of New York maintains *State University Scholarships,* five of which are awarded each county annually for each assembly district therein. Each of these scholarships entitles the holder to $100 for each year while he is in attendance upon an approved college in this State during a period of four years. At Cornell they are commonly known as the *State Cash Scholarships,* to distinguish them from the State Tuition Scholarships in this University. They are awarded by the State Commissioner of Education at Albany, to whom application should be made for any information about the conditions of award, or for any information about the rules of administration.

The University Undergraduate Scholarships

The University Faculty annually awards twenty-three scholarships to members of entering classes on the basis of competitive examination. The first five awarded are the George W. Lefevre Scholarships, which have an annual value of $400 each for every year the holder remains a student in good standing in the University; the other eighteen are the University Undergraduate Scholarships, which have an annual value of $200 each for two years. Candidates for these scholarships who apply for admission in October, 1945, are required to take the following tests to be given in April, 1945, by the College Entrance Examination Board: the scholastic aptitude test, the achievement test in English composition, and any two other achievement tests.

Scholarship candidates who submit College Entrance Board Examinations to satisfy entrance requirements for October admission will take the examinations once only, in April, 1945, and in the same manner as specified above.

All applicants for admission who wish to compete for these scholarships must before March 8, 1945, notify the Director of Admissions, in writing, of their intention to compete, and arrange with the College Entrance Examination Board, Box 592, Princeton, New Jersey, for the tests above specified.

Sears, Roebuck Scholarships

The Sears, Roebuck Agricultural Foundation has provided eight scholarships for farm-reared freshmen entering in 1944–45. The value of each scholarship is at least $125. The awards are made on the basis of financial need and of scholastic promise in the field of agriculture. Applications are to be addressed to the Office of Resident Instruction, Roberts Hall, Ithaca, New York, and must be complete by July 15.

New York State Bankers Association Scholarship

A scholarship of $150 is offered for 1944–45 by the New York State Bankers Association to a young man who has been a 4-H Club member who is recommended by his 4-H Club agent. It is awarded for the freshman year on the basis of financial need, scholarship, and the promise of service to agriculture. The 4-H Club agent in each county of New York State may recommend one candidate to whom he will forward an application form. Applications must be on file in the Office of the State 4-H Club Leader, Roberts Hall, Ithaca, New York, by June 1.

The Roberts Scholarships

The Roberts Scholarship Fund, a gift of the late Dr. Charles H. Roberts, of Oakes, Ulster County, New York, provides ten scholarships, each retainable for one year, but not open to newly entering students. As expressed by the founder, the purpose of these scholarships is to furnish financial assistance to students in the College of Agriculture who are of good moral character, who show native ability, tact, and application, and who are in need of such assistance, especially students coming from rural districts. The awards are made after the close of each year. Application blanks and copies of the regulations may be obtained at the office of the Secretary of the College of Agriculture. All applications must be on the official blanks, which, with all other information, must be filed with the Secretary of the College by June 1. The present value of each scholarship is $110.

Dreyfus Memorial Scholarships

Two scholarships of an annual value of $500 each have been established by Mrs. Berta E. Dreyfus in memory of her husband, Dr. Louis A. Dreyfus. In their award preference is given first to students coming from the high schools of Richmond County, New York, and next to those from Sandusky County, Ohio. First consideration is given to those specializing in Chemistry, Engineering, or Agriculture or, in the case of women, in Home Economics or Arts and Sciences. Application must be made to the Dean of the University Faculty before the first Wednesday of May.

Hervey S. Hall Scholarship

The Hervey S. Hall Scholarship, established by bequest of Miss Mary F. Hall, of Spencer, New York, and having an annual value of $120, is to be awarded to a properly qualified student of either sex, a resident of New York, pursuing a course in Agriculture leading to the degree of Bachelor of Science, and in need of financial aid. It is "to be granted first to a student from the town of Spencer, New York, should a suitable candidate appear, or else to a student from Tioga County, or from the State at large." Application for this scholarship should be made to the Secretary of the College by June 1.

The New York Florists Club Scholarship

The New York Florists Club offers a scholarship for 1944–45, having a value of $200 and divisible at the discretion of the faculty. The award is made to a student of the junior or senior class who is specializing in the field of floriculture and ornamental horticulture. Application for the scholarship should be made to the Secretary of the College by June 1.

The Robert M. Adams 4-H Memorial Scholarship

The Robert M. Adams 4-H Memorial Scholarship was established in honor of Professor R. M. Adams by the 4-H Clubs of the State. The scholarship yields approximately $50 a year. Students who are New York residents are eligible to apply after their first year in the College, and those who have been 4-H Club members are given first consideration. The award is based on financial need, character, ability, and scholarship. Application for this scholarship should be made to the Secretary of the College by June 1.

Other Scholarships

A description of other scholarships open under certain conditions to undergraduates in the College of Agriculture will be found in the *General Information Number.*

PRIZES

The Eastman Prizes for Public Speaking

With the object of developing qualities of personal leadership in rural affairs, Mr. A. R. Eastman, of Waterville, New York, established annual prizes, the first of $100 and the second of $20, for public speaking on country-life subjects. These prizes are designated the Eastman Prizes for Public Speaking. Competition is open to any regular or special student in the College of Agriculture. The contest takes place during Farm and Home Week.

The Rice Debate Stage

To stimulate the study and public discussion of vital farm-life problems, Professor James E. Rice, Professor of Poultry Husbandry, emeritus, has established annual prizes, the first of $100 and the second of $25. The contest is in the form of a debate. Preliminary trials are held in December, on a subject to be announced. The final competition is held in Farm and Home Week. All regular or special students are eligible.

The Ring Memorial Prizes

By bequest of Mr. Charles A. Ring, of Niagara County, New York, a first prize of approximately $25 and a second prize of approximately $15 have been established, to be awarded to undergraduate students in Agriculture who, in essays giving reviews of the literature on problems in floriculture, vegetable gardening, or pomology, show the greatest ability to evaluate scientific evidence. The contest is open to students who have taken or are taking courses in the horticultural departments and who are scholastically in the upper fourth of the senior class in Agriculture. A list of those eligible is announced each year. The essays must be submitted to the Secretary of the Faculty of Agriculture by noon on May 1.

The Charles Lathrop Pack Foundation Forestry Prize

The Charles Lathrop Pack Foundation Forestry Prize is in the amount of $40, and is awarded annually in April for the best essay on forestry submitted by a resident student who has taken some course in forestry during the current college year. The purpose of the prize is to aid in training men and women to write articles which will arouse in the public an interest in forestry and an appreciation of what forestry means to the country. The award is made by a committee appointed by the President of the University. The detailed regulations are furnished by the Department of Forestry or by the Secretary of the College. The essay must be deposited at the office of the head of the Department of Forestry by noon on April 15.

Alumni Prize

The Alumni Association of the College of Agriculture contributes an annual prize of $25 to be awarded at the close of the junior year to the student who has maintained the best scholastic record during his three years in the University, the award to be made by the Faculty of the College.

Alpha Zeta Cup

The Alpha Zeta fraternity has presented a prize cup to be awarded for custody for one year to the male student in the College of Agri-

culture making the best scholastic record during the freshman year. For students first admitted in the second term, the average of three terms' work is considered. Presentation of the cup is made at the opening of the fall term.

Other Prizes

Information concerning other prizes offered in the University and open to competition of students in the College of Agriculture, is given in the special pamphlet on prizes, which may be obtained upon application to the Secretary of the University.

Loans

The New York State Grange has established a loan fund to aid its members in obtaining a higher education. Applications may be made to Mr. H. M. Stanley, Skaneateles, New York.

A fund contributed by students of the College is available for small, short-time, emergency loans. Application may be made to the College Secretary.

A fund, the interest on which is available for loans to students specializing in Floriculture, has been established by Mr. Max Schling of New York City.

Another loan fund for students of Floriculture, with principal and interest available, has been contributed by the New York Florists Club. Applications for loans from this and the preceding fund may be made to the College Secretary.

Notice of other loan funds, available to students of all colleges in the University, is found in the *General Information Number*.

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